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ORIGINAL ARTICLES.

A FEW EXPERIMENTS WITH THIERSCH'S GRAFTS IN THE OPERATION FOR PTERYGIUM.

Read in the Section of Surgery and Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June 8, 1892.

BY F. C. HOTZ, M.D.,

PROF. OF OPHTHALMOLOGY IN CHICAGO POLICLINIC, CHICAGO.

A pterygium is nothing but a fold of ocular conjunctiva drawn over and fastened to the cornea, and to make our operation for pterygium a permanent success, we must after releasing the conjunctival fold from the cornea, arrange matters so that the conjunctiva cannot be drawn back over the cornea again. In a pterygium of moderate size this aim is usually attained by a very simple operation. The conjunctival fold is carefully dissected from the cornea, and allowed to retract as far as it will, from the corneal margin. This leaves between the retracted conjunctiva and the cornea, a small wound area to close which we draw the conjunctiva from above and below together, and unite the edges by two sutures. If this wound heals by first intention, there is no danger of a recurrence of the pterygium.

But in a number of cases the pterygium is so large, and the gap in the ocular conjunctiva after its dissection and retraction is so wide that it is very difficult, sometimes almost impossible, to close it with conjunctival sutures. At all events, the strain upon these sutures is so great that often they cut through in the first twenty-four hours and allow the wound edges to separate. The resulting gap is then gradually closed by granulation tissue, which is also filling the corneal area from which the pterygium has been removed. And when this new tissue begins to consolidate into a cicatrix, its shrinkage will gradually pull with an irresistible force the ocular conjunctiva over the cornea again. The pterygium has returned; our operation is a failure.

These failures make everyone wish for an operative procedure which promises better results. When, therefore, last year in August, I had occasion again to operate on a pterygium of this unpromising kind, I decided upon trying a new plan. I had by this time convinced myself in a number of cases of symblepharon that the thin skin shavings obtained by Thiersch's method are an excellent material for patching up defects in the conjunctiva. I give them decidedly the preference to graftings of mucous membrane; for the Thiersch grafts are much easier to handle and to fit; they need no sutures; they grow better and shrink much less. And as to appearance, they are as smooth as the surrounding conjunctiva, but look paler, more whitish.

Now it seemed to me worth the trial to fill the gap in the ocular conjunctiva caused by the dissection of a broad pterygium, with one of these Thiersch skin grafts; for if it adhered it would most assuredly keep the conjunctiva away from the cornea, and as it probably would look whitish, its color would blend well with the white of the eyeball.

These considerations induced me to try the skin grafting in the pterygium case last August. The pterygium reached to the center of the cornea, and the sides diverged from the apex backwards so rapidly, that when they crossed the corneal border they included about one-fourth of the corneal circumference. This pterygium was dissected off from the cornea,and the subconjunctival fibres which bind the pterygium to the sclera and cause the foldings of the conjunctiva,were carefully and thoroughly divided all the way back to the caruncle so that the conjunctiva could retract and unfold itself. The retraction left a large area of the sclera (10 mm. wide and 12 mm. high) denuded of conjunctiva. To fill this defect I shaved a Thiersch graft from the inside of the patient's forearm, transported it from the razor directly to the denuded sclera and spread it out smoothly over the entire wound. I had cut the graft a little larger than the wound so that when the graft was smoothened out over the sclera, the edges of the conjunctiva were overlapping the graft. My idea in tucking the edges of the graft under the conjunctiva was that the overlapping conjunctiva would assist in keeping the graft in place, and protect its edges against being rolled up or wrinkled by the frictions of the eyelids on the eyeball during the latter's rotations. But this part of the plan did not work well; for on the next day I found the edges of the graft were not under but even with the conjunctiva, and the graft reached about 2 mm. over the cornea. It had evidently been pushed toward the cornea just so much as it had been tucked under the conjunctiva. On the third day when I was satisfied the graft was firmly attached to the sclera, I lifted the edge which overlapped the cornea and trimmed it back even with the margin of the cornea. At first the graft had a pink color; but after the second week it was white, being covered with epidermoidal cells which could easily be scraped off. Later on the layer of epidermoidal cells become thinner but firmer, and now (I saw the patient on April 23 the last time) the surface of the graft is smooth and shining, and only a very little higher than the ocular conjunctiva. It has shrunken a little, more in the horizontal than in the vertical diameter; but it holds its place well, and forms a firm immovable bar which makes it absolutely impossible that the conjunctiva should ever again be drawn into the cornea.

In February I applied the same plan to two other cases of pterygium; but profiting by the experience of my first trial I cut the grafts smaller than the defects they were to patch up. In the second case the

defect measured 12 by 10 mm. and in the third eye 6 by 10 mm.; the skin grafts were cut 10 by 8, and 5 by 8 mm., respectively. Both took well and though after two months their horizontal diameter was reduced from 10 to 6 in the one and from 5 to 3 in the other eye, they still serve the purpose well of holding the conjunctiva back from the cornea.

I do not wish to draw any positive conclusions from these few experiments; but it seems to me they show that Thiersch's skin grafts readily adhere to wounds on the eyeball; that they may be utilized in patching up defects in the ocular conjunctiva; and that the insertion of a Thiersch graft may prove a valuable means to make the operation for pterygium a permanent success, even in the worst kind of cases.

Discussion.

Dr. A. E. Prince, Springfield, Ill.:—The valuable paper of Dr. Hotz commands recognition. I think the work an excellent one. I have had two cases in which there has been a similar experience and the results have been so satisfactory as to lead me to be very much encouraged. In one of the cases the conjunctival complication was a symblepharon. I transplanted a considerable portion of conjunctiva from a white rabbit's eye and greatly ameliorated the condition. In the second case the transplantation was taken from the inner surface of the lip and the purpose was to overcome a blepharophimosis. I took out a rhomboid section of mucous membrane of the lip and transplanted it. The result was very good in the relief of the symptoms.

Dr. G. C. Savage, Nashville, Tenn.:—I am inclined to the opinion that the reason for some of the returns of pterygium is to be found in the condition of the cornea left after removal. I do not think that it is proper to attempt to dissect off by instruments the corneal attachment of a pterygium. In that way we leave an unfavorable condition for the development of epithelium so as to rapidly cover in the denuded surface of the cornea. We leave some of the growth when we attempt to remove it by scissors or knife. I have never operated after the method of Dr. Prince in peeling off the corneal attachment with a strabismus hook, although I think that it would be better than the use of the knife or scissors. My plan is to make a puncture above and below the growth at the corneal margin through which I pass one blade of the scissors and make a V shaped incision with the opening toward the cornea. Then dissecting up carefully to the cornea I seize the loosened growth with fixation forceps, instruct the patient to look towards the nose while I pull in the opposite direction when every vestige of the growth is removed. Of course if there is much of the sclera exposed because of the broad base of the pterygium, then I conceive that the operation of Dr. Hotz is a good one, and I shall make use of it. If the open space is not so great, the edges of the conjunctiva can be brought together by sutures; and, before cicatricial tissue has formed, the corneal abrasion has been covered by epithelium. My experience is that the pterygium is not likely to recur after this method of operating. This operation is not new to me. I got the idea from some one, but I can not now say where.

Dr. H. M. Starkey, Chicago.—I should like to make a suggestion in regard to a method of treatment of pterygium which I have employed with highly satisfactory results in a few cases, not a sufficient number to make a report upon, but simply to suggest that others may try it. It is particularly adapted to those cases where there is a minimum amount of fibrous tissue and a large amount of vascular tissue. The method is that of electrolysis. We know how quickly a mild current of electricity will shrivel up blood vessels. In a case of pterygium which seemed to be composed almost entirely of blood vessels, it occurred to me that electricity would be of service. I therefore employed the negative current in a strength of one or two milliamperes with a platinum needle pressed under the growth and in two sittings the blood vessels were obliterated and the condition has not recurred. This is a painless operation under cocaine, is followed by little reaction and no mutilation. I have used it in half a dozen cases and have been well pleased with it.

Dr. A. R. Baker, Cleveland, O.:—It seems to me that the suggestion of Dr. Hotz is of immense value in symblepharon in which there is excessive loss of conjunctival tissue, but I think that it can not take the place of the old operation of transplantation of the pterygium below the cornea. You simply transplant the healthy conjunctiva to the place occupied by the pterygium. I have done this operation a number of times and have never felt the need for any other. Where the pterygium is very broad split it and put one part above and the other below the cornea. In this way we can manage any pterygium no matter how large.

Dr. J. E. Minney:—I use Prince's method in the main and find it very good. If I find that a portion of the pterygium remains I take a knife and scrape it off aiming to get it entirely smooth. I find that if I destroy the blood supply at the margin of the cornea, there is less liability to a return. The method which Dr. Hotz suggests is one that I shall give a trial. I have had cases in which I needed just such a method.

Dr. Henry D. Noyes, New York:—I had not the pleasure of hearing the paper of Dr. Hotz, but I should like to make a statement in regard to pterygium. In former times I regarded incipient pterygium as of no importance and thought it not necessary to interfere, but I have changed my views and in the last five years, experience has shown me that it is important to deal with pterygium even at an early period before it has advanced toward the middle of the cornea as it interferes with the curvature of the cornea. I have found by examination with the ophthalmometer the cornea rendered astigmatic by the pressure of a pterygium and that its removal has altered its curve. For this reason I have made up my mind that it is desirable to operate for pterygium at a period when it does not mechanically cause any interference with sight.

Dr. F. C. Hotz, Chicago:—As to the method of removing the corneal part of the pterygium, I cannot see why the removal should be less complete if we carefully dissect the conjunctival part from the cornea with a scalpel than if we remove it by the brute force of pulling. I am always opposed to any brutal manipulation about the eye and this pulling out of a pterygium looks to me like one of these manipulations. I think that I can more accurately gauge my interference with the tissues with the knife because I can control the effect of my cutting absolutely, but if I tear I cannot control that any more than when I tear a piece of cloth. But whether you remove it by traction or by the knife, there is a denuded surface of the cornea which must heal. If superficial, it may heal over at once with epithelium. In an old pterygium where the superficial layers of the cornea have been involved, it fills up with granulation tissue and forms a scar; and as this scar extends from the cornea back over the sclera, it draws upon the ocular conjunctiva and pulls it towards the cornea again.

The philosophy of transplanting the pterygium I could never understand except on the ground that the pterygium is a foreign growth, and from the remarks of Dr. Baker, I am inclined to think that he takes that view. But a pterygium is no new growth, but the conjunctiva which has become changed by chronic inflammation and drawn into the cornea. Fuchs has recently published a paper in which he says in regard to the histology of pterygium that it is a conjunctival fold in which there has been chronic inflammation with subsequent changes in the connective tissue, one of the characteristic features of which is a predominance of elastic fibres. Whenever you lift up a pterygium, you can see that it is connected loosely with the sclera, except along a transverse line following the extension of the horizontal meridian of the cornea toward the caruncle. Along this line, the conjunctiva is bound to the sclera by firm bands like cicatricial tissue and when these are cut you will see that the conjunctival folds spread out smoothly.

This goes to prove that the peculiar foldings of the conjunctiva in the pterygium are produced by the contraction of the subconjunctival connective tissue.

THE CARTWRIGHT PRIZE FOR 1893.—The usual award of this prize, valued at five hundred dollars, will be made in June, 1893. The alumni of the Medical Department of the New York College of Physicians and Surgeons are the sponsors for this valuable premium for original medical investigation. Any person may compete, and he may write upon any subject connected with the science of medicine. About the only restrictions are the provisos that the prize may not be given to two or more persons working jointly, or to a competitor who has sent his essay elsewhere to compete for another prize. The personality of the author should be, as is the usual rule, concealed, and the papers must be sent to the secretary of the alumni on or before April 1, 1893.

OSTEOMA OF THE ORBIT, REMOVAL WITH PRESERVATION OF VISION.

Read before the Section of Ophthalmology, at the Forty third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY EDWARD JACKSON, M.D.,

PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC, SURGEON TO THE WILLS EYE HOSPITAL.

The following case seems to me to be of sufficient importance to place upon record:

Miss M., æt. 18, had noticed two years before, a swelling of the left upper lid, pretty uniform and unaccompanied by pain or soreness. This swelling has since then increased gradually until the present time. For the last few months, there has been some pain over the upper inner angle of the left orbit.

About one year ago she noticed that the vision in the left eye was not so good as in the right, but the eyes had not previously been separately tested, and there has been no deterioration of vision since. In the right eye the vision is as good as it has ever been. In the right eye the media are clear; there is hyperopic astigmatism; the disk is oval clear, of good color; fundus dark, normal. Left eye, media clear; higher hyperopic astigmatism; disk oval, clear, of good color; arteries bear due proportion to veins in size. Muscle tests, show right hyperphoria of from 0 to 1 centrad; laterally there is muscular balance, power of abduction 5 centrads; adduction 10 to 12 centrads; sursumduction, right or left, 1 centrad. A hard tumor is felt below the upper margin of the left orbit from which it is separated by a distinct though narrow sulcus. It extends from the inner third to the outer angle of the orbit, and about one centimetre in the vertical direction. The left eye is displaced downward one centimetre and forward eight millimetres. No lateral displacement can be recognized.

1891, October 9, I removed the tumor. A free incision was made through the upper lid just below and parallel to the upper margin of the orbit, and the growth freely exposed by the retraction of all the soft parts; it proved to be entirely hard and connected with the roof of the orbit by an apparently broad base and to extend more than half way back to the apex of the orbit. The exposed surface was bitten away with rongeur forceps. But it was soon evident that these would remove but a small part of the growth. The saw was tried but could not be used to advantage. The chisel gave no result, because I feared to apply sufficient force, not knowing at what point it might cause fracture. With a hand drill however, three holes were made in different directions, and the intervening bone split with the chisel, separating the growth from its attachments, and dividing it in two principal fragments which were then extracted. During this process, there being a tendency to extrusion of the globe between the lids, at the suggestion of Dr. Risley, these were stitched together and the stitch removed at the completion of the operation. The attachment to the walls of the orbit proved to be upward and inward three-fourths of an inch back from the orbital margin, and the removal of the tumor opened the ethmoidal sinuses so that blood escaped through the nose. The tumor weighed about 13 grams. The wound was washed out with bichloride solution, a catgut drain brought out at the outer angle, and the wound closed with seven sutures; a gauze dressing was applied with a bandage, so as to make firm pressure on the lower lid. The operation was done under ether and lasted one hour and three quarters.

The temperature did not rise above the normal, the wound closed by first intention. Drainage and sutures were removed on the seventh day. At the first dressing, next morning, there was found considerable swelling, especially of the conjunctiva which protruded between the lids, and could not be entirely returned. Next day, the protruding portion was snipped off, after which the swelling and hyperæmia rapidly diminished. At the end of two weeks the swelling was greatly reduced and the globe had almost, but not entirely returned to its normal position. There was, however, very little power of moving the eyeball, and diplopia was experienced in all parts of the visual field except the centre. There was complete ptosis.

From this time there was rapid improvement in the motility of the globe, and at the end of four weeks she experienced diplopia only in the extreme periphery of the field of binocular vision. The ptosis had decidedly lessened. One month later, her recovery was complete except a moderate ptosis. Her condition continued the same up to the time she was last heard from. With Right + 0.25 sph. ⊃ + 2. cyl. ax. 110°, V.= 4-4 mostly. Left + 0.25 sph. ⊃ + 3. cyl. ax. 65°, = 4-15, about the same as before the operation.

It is interesting to note in this case that although the tumor appeared in the outer two-thirds of the orbit, its origin was from the upper inner angle about three-fourths of an inch back from the orbital margin, and the displacement was directly forward and downward.

Although the eye-ball had been carried forward to the extent of almost a centimetre and the insertions of the muscles to that extent removed, there had been no squint or diplopia, there was very little heterophoria, and no marked weakness of the ocular movements.

All the movements of the eyes except the elevation of the upper lid were completely restored within a few weeks.

In the removal of the exostosis which was throughout almost its whole extent, of ivory like hardness, the common bone drill worked simply by hand, penetrated rather rapidly and proved by far the most efficient as well as the safest means of attack.

A CASE OF RARE FORM OF ORBITAL TUMOR.

Read in the Section of Ophthalmology at the Forty-third annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY G. E. FROTHINGHAM, M.D.,

OF DETROIT, MICH.

Cases in which tumors are developed in both orbits are extremely rare. That the tumors should occupy exactly the same position in each orbit, and correspond in form and size, and develop at nearly the same time, is still more remarkable. For these reasons, as well as some other unusual characters, I have thought the following case worthy to be put on record.

Miss E. D., age sixteen, of Canton, Michigan, consulted me January 11, 1892.

The father gave the following history: In May, 1890, she noticed a tumor of the left orbit. There was no pain in the tumor or protrusion of the eyeball, but the tumor projected somewhat, and was situated above the eye, extending from the inner extremity of the superciliary ridge to the outer canthus, and causing a prominence parallel with, and just below this bony arch. The tumor felt hard and was slightly movable on firm pressure. She visited the clinic at Ann Arbor, and had an operation for its removal, in December of the same year. A large firm tumor was removed. The eyeball protruded after the operation, presenting the appearance shown in the photograph here presented which was taken on the 10th of May last. The recovery from the operation was rapid, the patient leaving the hospital in about a week after it was performed. While recovering from the effect of the operation, she was feeling about her right eye, and noticed a tumor over it in the same position as the one which had been removed from the left orbit. It had also the same feeling and was slightly movable; she also noticed before she left the hospital that there was a small tumor at the outer portion of the left orbit and also one near the center of the lower portion below the eyeball.

At the time I examined her, there was a large tumor of the right orbit, causing a prominence projecting to about the same level with the bony margin, and about an inch and a half in length on its anterior border. It was situated above the levator palpebrarum and close to the orbital plate of the frontal bone. The eyeball was displaced downward and there was double vision, except when looking sharply downward, the image of the right eye being above that of the left. There was a tumor at the outer margin of left orbit, slightly movable and apparently extending deeply inward. There was also a small, very movable tumor below the left eye, which still remains. On the 14th of January, assisted by my son, Dr. G. E. Frothingham, Jr.,

and by Dr. L. Connor, I operated for the removal of the tumor of the right orbit.

An incision was made along its anterior border down to the tumor, which was carefully dissected from the surrounding tissues, by means of the handle of the scalpel and probe pointed scissors. When this had been done, the tumor was carefully dragged from its bed, bringing with it the firmest strands of connective tissue, which extended inward from its deep border at the bottom of the orbital cavity. The supra-orbital nerve was so intimately blended with the tumor, that it had to be sacrificed. After the hæmorrhage had ceased, a small drainage tube was inserted sufficiently deep to allow escape of any blood that might accumulate from subsequent oozing, and the edges of the cut then brought together by suture, and the wound dressed with cotton saturated in solution of bichloride of mercury, 1-2000. There was but little reaction, and the patient left the hospital in one week from the operation, with the wound healed and the parts almost entirely free from swelling. The double vision was completely relieved by the removal of the tumor. The tumor measured a little more than an inch and a half along its anterior border, and about the same along its posterior border. It extended also a little more than an inch and a half into the orbit. It was wedge-shaped, the base forming the anterior portion of the tumor. The thickness of the firm portion was, at the base, a little more than three-eighths of an inch at the inner extremity, and slightly over one-fourth of an inch at the outer extremity. It grows gradually thinner, as it approaches the edge.

It is very firm to the feeling like fibro-cartilage, and resembles on section the appearance of dense, white fibrous tissue, or condensed connective tissue.

There was some degree of ptosis of the lid, after the operation, but that was soon recovered from. There has been no sign of recurrence of the tumor of the right eye up to the present time. There is no resulting exophthalmus, and vision is unimpaired. The patient being anxious to be relieved from the proptosis of left eye, I operated upon it on the 10th of May, last Making an incision, extending the outer canthus, and then dividing the palpebral ligaments of both lids to a sufficient extent. I thus made an opening sufficiently large, without endangering the nerve supply of the orbicularis. Through this opening I removed a tumor about three-fourths of an inch long, half an inch wide, and one-eighth of an inch thick, extending into the orbit behind the globe. The periosteum seemed thickened at the bottom of the orbit, but no distinct tumor could be felt. The tumor below the eye could not be removed through this opening, and I thought it more judicious to leave it for a subsequent operation, than to make so extensive dissections at one time. The wound was treated as in the operation upon the right eye. The inflammatory reaction was, however, much greater, and seemed quite threatening during the first thirty-six hours. It then began to subside. The conjunction was much swollen, however, and it was two weeks before it could be fully replaced under the lower lid. The vision is unimpaired and the proptosis seems less though not greatly diminished by the operation.

An examination made by Dr. George Duffield, shows the tumor to be a fibro-sarcoma, with the fibrous element very largely predominating—a tumor that is sometimes called a fibroma. It seems to develop from connective tissue, and is not a frequent form of sarcomatous tumors. It is said that a preponderance of cellular elements is the peculiar feature of all sarcomata. At any rate, those I have found, either within the eye or the orbit, were rich in cells and quite friable, instead of being firm and tough like the one here presented. I believe such tumors nearly always become very rich in cells, and have blood-vessels within them before they have grown to the size this one had reached.

The tumor removed from the left orbit by Prof. Carrow, Dec. 4, 1890, was reported by the pathologist as a sarcoma, but the variety was not given.

Discussion.

Dr. H. Knapp, New York:—I beg to make some remarks especially with reference to the paper of Dr. Frothingham. I wish to point out the difficulty in diagnosis in some of these cases, as on three occasions I have fallen into a great mistake. Some of these tumors are benign although they present the features of malignancy. I remember three cases of this kind. The *first*, was an individual, about 20 years of age, with a tumor situated deeply in the orbit producing exophthalmus. It was supposed to be a sarcoma and yet it completely disappeared.

In the *second* case, there was considerable exophthalmus from large growths in different parts of the orbit. The eye was taken out by one of the surgeons of the Manhattan Eye and Ear Hospital and the tumor cleanly removed. On microscopic examination, it was pronounced to be a small-celled sarcoma. The patient came to me two years later with the same condition in the other eye. There was great protrusion of the eye and solid masses were distinctly felt in the orbit. I could not advise the woman to have that eye removed and I was not sure that otherwise the radical removal of these tumors could be accomplished. She was under general treatment and three or four months afterward I heard that she was better and that the tumors gradually diminished in size. After about 15 months she again came to me and was perfectly cured. The growths and the exophthalmus had disappeared without leaving a trace and without any injury to the functions of the eye.

Another case was sent to me last year, by Dr. Morgan, of Springfield, Massachusetts. The tumor had sprung from the inner side of the orbit and seemed to be connected with the periosteum. It looked like a periosteal sarcoma. Dr. Morgan removed the growth and the microscope showed that it was sarcoma. That patient had similar growths in the nasal passage of the same side. It seemed to be a case of sarcomatous growths of the nasal passages protruding into the orbital cavity. After the removal by Dr. Morgan, there was a rapid relapse. In several months the growth was as large as before. The tumor seemed to go into the wall of the orbit so deeply that I did not think any operation could be done with benefit. The orbital small celled sarcomata are as malignant as any tumors can be. This patient after leaving me went to an electrician and also took some indifferent remedies. She perfectly recovered. She said that the improvement began after being under the electric treatment for four or six weeks and had steadily continued. Not long ago she presented herself to me and there was no trace of the trouble left. The orbit was normal and the nasal passages were free. She came to express her gratitude that I had advised her not to be operated upon.

What are these growths that come under the mask of sarcoma and evidently are not malignant? They are not fibromata for they do not disappear. The only thing that I can imagine is that they are lymphomata. In the first case the diagnosis of lymphoma was not so difficult because there were swellings in other parts. It was a symptom of Hodgkin's disease. In the other two cases, there was nothing to lead me to such a diagnosis. The disease was purely local. The histology of the tumor was in all the same, a small celled tumor with more or less fibrous tissue. When

I see such a tumor, if I am sure that it is not in connection with the orbital walls, I hesitate to advise its immediate removal. If it progresses there is nothing else to be done. If the tumors are multiple and malignant, we cannot do any good. If there is such doubt and I think the doubt cannot be entirely excluded, I would rather wait before committing myself to the removal of the eye or tumor.

The different elements which constitute these tumors may perhaps lead to the diagnosis of lymphoma. We must also bear in mind the possibility of diffuse or disseminate sarcoma which is the worst kind of all. We think to have removed them cleanly and it is not two months before you see tumors in the neighborhood. Some of these cases have been sent to me for operation after some of the tumors have been removed. I have removed the orbit's contents cleanly to the periosteum and on examining them I have found all through the orbital tissue, patches and nodules of sarcomatous tissue. In one case the diffuse sarcoma was melanotic and had invaded the optic nerve. These points are to be taken into consideration in the diagnosis of these tumors of which some are certainly benign.

Dr. Reeves, Toronto:—Seventeen years ago I enucleated an eye for sarcoma in which there was found a melanotic tumor. The tumor was not examined microscopically. It was a firm tumor occupying a large portion of the vitreous chamber. About sixteen years later, two years ago, the patient again presented himself. For fifteen years there had been no sign of disease of the orbit. On examination I found indications of sarcoma of the orbit and two years ago last October, I operated. The patient had marked cephalalgia. I cleaned out the orbit completely and applied chloride of zinc. Microscopical examination showed the tumor to be a melanotic sarcoma of the optic nerve. The patient is in good health with no sign of return of the growth. The cephalalgia disappeared in a few weeks after operation.

I do not consider this a case of true recurrence of sarcoma, I do not believe that sarcoma can remain latent for fifteen years. It is a case rather that may be explained on the principles of the abnormal development of embryonic tissue which existed there from the beginning.

Dr. Julian J. Chisolm, Baltimore:—About a month ago, I had occasion to take out an eye in a case that presented the question, at what period during the existence of an intra-ocular tumor is systemic infection established? The patient had bad detachment of the retina with absolute loss of vision, for one year but unaccompanied by pain. A week before I saw him the first pain was experienced. The eye was much injected, there was the usual tension, and the pupil was slightly dilated. These were all evidences of an intra-ocular growth and a correct diagnosis was made although the detachment of the retina excluded the use of the ophthalmoscope. When the eye was removed and opened, I found a growth not larger than a pea which proved itself a melanotic sarcoma. It had infiltrated the sclerotic although the inflammatory symptoms with tension had existed only one week and the tumor did not occupy one-sixth of the vitreous space.

Dr. S. C. Ayers, Cincinnati:—I have recently had a case of tumor of the orbit, which was to me, one of extreme interest. I first saw the patient a year ago last March. There was a little exophthalmos and vision was considerably reduced. There was infiltration of the optic nerve and under the lower lid one could feel a suspicion of a growth. I again saw the patient a week or ten days later. Vision had fallen to one-half and I thought that I could feel that the tumor had developed in these few days. I gave my opinion that it was a sarcoma originating in the apex and pressing forward rapidly and that vision would be more and more reduced and advised removal of the tumor and removal of the globe if necessary. I thought that it was not possible to save the globe. I saw the patient no more until fall. He went elsewhere and an attempt was made to remove the tumor and save the globe, but the attempt was not successful in either direction. Panophthalmitis followed the operation and the man suffered intensely for a long time and the tumor again began to grow. When I saw him in the fall, there were four or five large firm nodules around the rim of the orbit. I said then that it was useless to do anything. I saw the patient from time to time, but the tumor was evidently not growing forward, but was clearly advancing toward the brain. He was soon bed fast and his nutrition seriously impaired. He lost flesh and in February had paralysis of the right arm. The tumor involved the right eye. He died about six weeks ago. During the latter part of his illness there was observed a ridge or elevation in the periosteum extending upwards and following the suture of the parietal bone. The bone was tender. He also complained a good deal of pain in the region of the cerebellum.

When the post-mortem was made we found that the parietal bone and the upper portion of the frontal and of the occipital bones were softened. The parietal was so softened that it could almost be penetrated with a knife. The internal surface of the parietal was covered with a growth looking like granulations. The internal and external surface of the dura was covered with a similar deposit. The granulations on the internal surface were larger and more exuberant than those in other places. The sphenoid bone could be cut with a knife. The tumor had not involved the brain, but had simply grown over the anterior surface and pressed it down. The operation originally would have had no more influence than to prolong life for a little while. The extension of the growth backwards and the involvement of the bone and dura mater was something new in my experience.

Dr. Johnson, Paterson, N. J.:—I agree with Dr. Knapp as to the necessity of considering carefully the desirability of making these operations, on account of the possibility that the tumors may be benign in their nature. At the same time I had occasion to see a month or two ago a case in which, after operation was advised, delay had been made as a result of the desire of the patient's family. When the tumor became sufficiently increased in size to alarm them, they permitted operation, which was followed in a short time by rapid recurrence of the tumor and death of the patient. I think that it is desirable, if operations on orbital tumors are to be made, that they should be made early. I have operated on a number of orbital tumors, some of which were sarcomatous in their nature; one in particular, on which I operated eight or nine years ago, was reported in the *Archives of Ophthalmology*. The growth was examined microscopically by Dr. Prudden, and pronounced to be a myxosarcoma of the optic nerve. Up to this time there has been no recurrence. Whether or not this was one of those tumors with a malignant appearance and a benign effect, I cannot say. In these tumors presenting a malignant appearance it is desirable that they should be removed as soon as we can make up our minds whether they are malignant or benign while it is still possible to remove the entire growth.

Dr. J. A. White, Richmond, Va.:—I have seen cases of sarcoma which did not recur. Fibroma is not in its nature malignant, but I consider it more malignant than ordinary sarcomatous growths, because it almost invariably recurs. I have seen only three cases of fibroma of the orbit, and in every case there was recurrence. I think that it is difficult to state how much the fibrous change has taken place in certain tissues, because of the little difference microscopically from the normal appearance.

In regard to whether or not the last growth will recur, I do not know, because I have never seen a case of miliary tuberculosis of the orbit before.

Dr. George E. Frothingham, Detroit:—I should like to add one word in connection with these tumors. It has been questioned here whether a melanotic sarcoma can remain stationary as long as fifteen years. I remember a case where a melanotic sarcoma of the choroid had ruptured through the external tunics. It was thoroughly removed, but after six or eight years, it recurred. All the contents of the orbit were then removed, and after four or five years, it again returned.

As to the question of the malignancy of these growths, I think that we have very imperfect knowledge. One fact has been well established, that is that some of these cases will never recur, while in others operation seems to stimulate their growth. In 1876, I had a peculiar case which bears upon this matter. A patient came with a painful, blind eye, the lens opaque and the iris attached to the lens, and the tension increased. He had such severe pain that enucleation was decided upon. Fearing malignancy, the nerve was cut as far back as possible. After removing the tumor, I examined the eye, and found about the optic nerve some connective tissue which felt a little harder than normal. Internal examination showed no tumor within the eye. It was simply a case of chronic inflammatory disease. A few months afterward the patient came with a large mass protruding from the orbit. I think that within five months after the eye had been removed, that immense mass developed. It was so evidently malignant that I at once decided to operate. The whole contents of the orbit were removed. The growth was so closely connected with the bony wall of the orbit that I decided to apply chloride of zinc paste. This produced necrosis of the bony wall, so that the brain protruded into the orbit, and then the wound granulated.

His physician reported a few months later that he had died with all the evidences of malignant disease of the kidney. Examination showed the growth to be a giant-celled, rapidly growing sarcoma.

Another case occurred in a child 2 years of age. A firm tumor was found at the outer part of the orbit. It had the feel of a sarcoma, and connective tissue was found extending into the bone. It was cut loose, but rapidly recurred, and the child died.

THE ETIOLOGICAL RELATION OF NASAL DISEASES TO AFFECTIONS OF THE EYES.

Read in the Section of Ophthalmology at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June 1892.

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Within the past eight years various publications have appeared intended to show a connection between certain ocular and nasal disturbances.

The proof that lesions of the orbit, eye and its appendages or symptoms referable to these parts are induced by preëxisting nasal diseases, can be furnished in various ways, viz.:

1. We may trace anatomically the extension of disease of the nasal cavity into the orbit or into the appendages of the eye.

2. We may observe clinically the involvement of these parts or of the eye itself in disease consecutive to and in direct connection with nasal disease.

3. We may influence in a characteristic manner by means of nasal treatment eye effections the prognosis of which is definitely known.

4. More decisive than these methods is the experimental production of eye lesions in animals in consequence of nasal disturbances. As yet, nothing has been done in this line. But practically equivalent to experiments on animals are various observations of disturbances in the eyes or lids following experimental irritation or irritant treatment of the nose in patients.

Of these different modes of proving the connection between ocular and nasal diseases the first method is the most definite one, no matter whether we trace the extension of the disease during life or at an autopsy. The second way, the clinical observation of the evolution of the ocular disorder demands reliance upon the patient's statements, since the physician can but rarely see such cases at their incipiency. The sequence of the two disorders is after all only suggestive of the dependence of one upon the other; it is not an absolute proof. It is only the repeated observation of cases with similar histories in this respect that can establish the etiological relationship with some certainty. But it must not be demanded that because a certain eye disease is of nasal origin in some instances it should always depend upon the same etiological conditions.

Most of the writers on this subject have employed the third mode of reasoning—that is to say, the therapeutic test.

When they observed an improvement in certain eye symptoms after nasal treatment they reasoned that the nasal condition has been the cause producing them.

This mode of reasoning however, is beset with errors, against which we must guard ourselves. The prognosis is not always so certain in the class of diseases principally referred to, especially asthenopic complaints, so that an improvement following any given treatment can be attributed to that treatment only if it sets in very promptly. We must be sure that neither other measures employed, nor the mere lapse of time are responsible for the patient's improvement.

Moreover, in estimating the beneficial results of any new treatment, particularly of a surgical character, upon nervous symptoms we must not ignore the possibility of mental suggestion. For these reasons as well as on account of the short period of their observation some of the cases and conclusions recorded in literature are not as convincing of the relation of the nose to the eye, as their authors claim.

When the question arises whether actual ocular lesions and not mere functional derangements are to be considered as secondary results of nasal disease the therapeutic test cannot be regarded as an absolute criterion. For lesions once started do not necessarily cease on removal of the conditions that induced them. In such instances the etiology can only be established on the basis of careful histories.

American authors have mostly dealt with functional derangements only, but cases published by Gordon, de Schweinitz and various European observers, as well as my personal experience, point out that also different lesions of the eye and its appendages may be of nasal origin.

On the basis of personal experience, and aided by the published observations of others, I shall attempt to classify the various ocular derangements dependent upon nasal disturbances, and will aim to distinguish critically between actual proof of such connection and mere probability of nasal origin.

I. In diseases of the *lachrymal passages* nasal affections are found present in the majority of instances [20 22 40 and personal experience]†. In speaking of nasal diseases or anomalies, I refer to demonstrable lesions or marked deviations from the normal shape, no matter whether they give the patient annoyance or not. If we were to diagnosticate nasal disorders only on the strength of the patient's statement as to the discomfort in the nose, we we would overlook many instances of chronic disorders in the less observing class of people. On the other hand, whenever I speak of acute nasal catarrh, I do not rely on the patient's reference to a "cold," but demand a definite history of the symptoms of coryza.

The mere coincidence of nasal disorders, so common in our climate, with lachrymal disease, is far from being a proof of their correlation. Stronger, however, is the evidence that in one-sided lachrymal disease the affected passage corresponds almost invariably to the more abnormal side of the nose. A direct proof that the nose is the starting point of the disease of the tear-canal can only be obtained when an intelligent patient observes the insufficiency of the tear duct or the inflammation of the sac beginning during an acute attack of nasal disease. Of such instances I have a number in my records. I do not wish to overlook, however, that occasionally lachrymal disease, especially narrowing of the canaliculi, is the result of conjunctival disease.

The therapeutic test is not decisive in lachrymal affections. Neither in stricture of the duct nor in suppuration of the sac, can removal of the nasal lesions restore the integrity of the lachrymal passage

†The figures in brackets refer to the authors quoted at the end.

without surgical treatment of the diseased part. But that nasal treatment can aid the local procedures in maintaining the patency of the lachrymal passage is proven by the cases published by de Schweinitz,[40] as well as by some similar observations of mine.

It may be in place to point out a source of error in estimating the influence of nasal treatment upon diseases of the tear-passages. *Lachrymation* is not necessarily indicative of obstruction of the tear canal. An abnormal flow of tears may result from disease of the conjunctiva or eye as well as—in many persons at least—from nasal irritation, even when the tear canal is normal. On the other hand, an obstructed duct leads to an overflow of tears only when they are secreted in excess. Some patients with stricture, or even after obliteration of the sac, have epiphora only when the eye is irritated by wind. Nearly all authors who have written on the relation of the nose to the eye speak of lachrymation as a symptom produced by nasal irritation and cured by nasal treatment. The beneficial influence of nasal treatment, when undertaken in connection with local measures directed against the disease of the lachrymal passage, is therefore not a definite proof that the lesion in the duct or sac was cured thereby. It signifies only that the excessive reflex secretion of tears has been stopped.

II. The *eyelids* are the seat of occasional vascular disturbances in persons with irritative forms of nasal disease. The attacks may amount to a transient *circumscribed œdema*, perhaps analogous to urticaria, or may resemble *erythema*, or even a *pseudo-erysipelatous* condition. The attack may be one-sided or bilateral. Hack[1] claims to have proven their nasal origin by several observations in which they followed the use of the galvano-cautery in the nose, while in some other instances their habitual recurrence ceased after nasal treatment. I[15] have seen about half a dozen of such attacks, but have never had the opportunity to follow the results of nasal treatment for a sufficient length of time to prove the nasal origin by the therapeutic test. In every instance, however, there was the history of habitual nasal irritation with an acute exacerbation preceding the skin trouble.

Blepharitis has seemed to me to be dependent in some instances upon nasal disturbances. I have repeatedly observed the squamous form of this disease relapse during treatment when the patient got a fresh coryza. A few times, I have seen the inflammation of the lids cease spontaneously, after a cure of the coexisting nasal condition, for which the patient had applied to me. On the other hand, I have three times seen an ulcerative blepharitis, in which I could easily stop the ulceration by local measures, but could not remove the parenchymatous inflammation of the edge of the lid until I began to treat an atrophic rhinitis evidently maintaining the blepharitis. In these instances the condition of the lid improved in proportion to the amelioration of the nasal process.

III. Of diseases of the *conjunctiva*, I have seen not very rarely a *subacute conjunctivitis* occurring during the course of a fresh coryza. Its dependence on the nasal trouble seemed probable, because its course ran parallel to that of the coryza. While its intensity could be reduced by use of nitrate of silver or sulphate of zinc, it could not be checked with the same promptness as ordinary conjunctival catarrh. A similar conjunctivitis likewise rebellious to all treatment, is often seen in hay fever. I have formerly described a form of periodic hypertrophic conjunctivitis allied to hay fever (*American Journal of the Medical Sciences*, April, 1886), but cannot say whether this condition depends on nasal trouble

Chronic *congestion* of the conjunctiva is often observed in connection with chronic nasal irritation or stenosis, and will not be found to yield to any treatment except removal of the nasal anomaly. The congestion is not necessarily limited to the lining of the lids. Indeed, the history that an eye without active inflammation, is at times bloodshot, I have found to be quite characteristic of irritation of nasal origin. Such eyes are apt to be irritable. I have seen several cases of injection of the conjunctival and scleral vessels with considerable smarting or burning of the eyes maintained by protracted follicular inflammation of the pharyngeal tonsil, sometimes without marked discomfort in the throat. The dependence of the eye disturbance upon the pharyngeal infection, was shown by the prompt influence of applications of nitrate of silver to the inflamed adenoid tissue.

The conjunctival congestion may pass into *catarrhal* inflammation. I take this to be a secondary infection, because it is easily arrested by conjunctival treatment, but is apt to relapse unless the underlying nasal disorder is removed. But cases have also been reported, first by Gordon, and since by other American authors in which a severe chronic conjunctivitis with thickening of the mucous membrane did not yield to any local measures, but were promptly cured by the cure of a rhinitis.

Attention has been called by Ziem and by Despagnet[32] to the frequent coexistence of trachoma and nasal catarrh. There is no proof, however, that they are related to each other, although some observations like those of Taylor[26] make it not improbable that nasal trouble can account for the obstinacy of some cases of trachoma.

IV. A dependence of some *corneal* diseases upon nasal disorders is probable, but not yet definitely established. Trousseau[28] speaks of 11 instances of corneal ulcers which did not heal promptly until an ozœna present was treated. Yet the case given in illustration is by no means conclusive of any connection.

Phlyctenular keratitis and the *punctiform corneal infiltrations* of scrofulous children, are as a rule accompanied by a sero-purulent rhinitis.[38] In some instances, I have seen every relapse of this form of corneal disease preceded by nasal obstruction and discharge. Nasal disease does not, however, exist in all cases. The therapeutic test is rarely conclusive, though often suggestive of a nasal factor in the causation of phlyctenular keratitis. As a rule, the corneal trouble yields readily to local treatment. Still I have seen a fair number of children in which the corneal disease lingered while the nasal condition had received no attention, either on the part of other competent oculists or a few times in my own practice. In some of these instances the treatment of the rhinitis was followed by prompt improvement of the corneal lesion, in others, however, not.

Three times I have seen a very characteristic type of corneal disease in the form of flat papules on the limbus and pinhead-sized specks of infiltration in the cornea supplied with bundles of blood vessels comparable to the so-called fascicular keratitis. The in-

dividual lesions were of long duration,and left cloudy spots on the cornea, while relapses protracted the course for months. In every instance there was a marked diffuse hypertrophy of the nasal mucous membrane (not merely of the cavernous tissue) and with it thickening of the external nose. The pharyngeal tonsil was moderately enlarged in two of the cases. The disease was not influenced by any treatment. But the negative result does not exclude a nasal origin, for while the surgical treatment improved the patency of the nose it did not lead to full integrity of the nasal lining during the time of observation. Two of the cases got well spontaneously; the other one was lost sight of. (See also Ziem [8].)

V. *Iritis* occurs occasionally though not frequently during an acute coryza. The possible connection between the two affections is emphasized by the statement of some intelligent patients with relapses of iritis, that every attack was preceded by acute nasal inflammation. Ziem [17] has also noticed the occurrence of iritis in connection with suppuration of the nose and accessory cavities and thinks that nasal treatment exerted a distinct influence in one instance.

VI. *A not well defined intraocular affection suggestive of chronic glaucoma* has been observed—once by Berger [13] following a galvano-caustic operation in the nose which resulted in necrosis of the nasal wall—while Ziem [14] has reported three such instances caused by intra-nasal cauterization. The eye involved corresponded to the injured side of the nose. The patients had either slightly reduced central vision or what was more characteristic with it a restricted field of vision and diminished accommodation.

In Ziem's cases there was venous congestion and pulsation of the papilla. The sight improved spontaneously,but the histories do not proceed until complete recovery. Ziem [23 24 27 29] subsequently reported several more observations in which similar symptoms, notably the restricted field of vision, occurred in patients with empyema of the maxillary sinus,but ceased after cure of the suppuration. Several times there was suspicious hardness of the eyeball. In two of the patients with disease of the antrum on both sides the sight of one eye had previously been destroyed by some intraocular process,apparently cyclitis. Lennox Browne [16] also refers to a case of chronic glaucoma not benefited by iridectomy, but apparently arrested and the sight improved by the removal of nasal polypi.

Ziem attributes these attacks of reduction of sight, field and accommodation to intraocular congestion especially of the ciliary body. There is, however, no proof of their glaucomatous nature; they do not even correspond to the prodromal stage and excavation of the papilla was never present. The case mentioned by Browne is not described sufficiently to be intelligently criticized. I could find no other observation of this kind on record and have never seen the condition in any of my patients with empyema of the antrum.

VII. The *optic nerves* are separated from the cavity of the sphenoid sinus by a bony wall, frequently quite fragile and not rarely imperfect. Disease of the sphenoid sinus, suppuration, caries or tumors may hence lead to compression and neuritis of the chiasm and intracranial portion of the optic nerves. Berger and Tyrman [10] collected 23 cases of this nature from the literature up to 1880, and in his latest monograph Berger [43] refers to 5 additional instances. Some of them, however, were due to growths of the sphenoid bone, and hence cannot range amongst eye affections of nasal origin. Various authors seek the cause of retrobulbar neuritis in infection through the sphenoid sinus. However plausible this view may be, it is in no way proven, and the cases quoted by Berger [43] p. 37, are not convincing of such an origin.

VIII. *Neuritis* of the *nerves supplying* the *muscles* of the eye seems to depend occasionally upon nasal inflammation according to my own observations. During the past 18 months I have seen but three instances of paralysis of ocular muscles, the course of which characterized them as of peripheral, not syphilitic origin. In all these cases the paralysis was preceded by a severe nasal catarrh in the course of which persistent headache set in, which was then followed by the sudden paresis. Twice the nerve involved was the abducens, once the extraocular fibres of the third nerve. All three ended in recovery. The inference that the neuritis resulted from extension of the nasal infection was strengthened in one case by the existence of a polypus high up on the same side of the nose.

IX. *Orbital disease* may be simulated by morbid processes in either the frontal or the ethmoid sinus. As the consideration of such instances is almost foreign to our subject, I will refer simply to the reviews by Berger and Tyrman [10] and by C. Stedman Bull.[39] But suppurative inflammation of these cavities may indeed penetrate into the orbit, leading to circumscribed *orbital abscess* as in the cases recorded by Peltesohn.[19] To what extent the numerous instances of orbital phlegmon and of tenonitis observed after influenza, resulted from the extension of inflammation in the nasal and accessory cavities is a subject worthy of further study. Various instances of *orbital tumors* also took their origin from the ethmoid and frontal sinuses.[10-43]

In rare instances, neoplasms of the nasal cavity may also invade the orbit. Nieden [9] reports two cases of malignant growth in the nose entering the orbit, one directly by perforation, the other by way of the cranial cavity. Personally, I have seen a cavernous growth of the nasal cavity extend into the orbit. The vascular tumor originating in the nose and filling one side of it completely, was radically removed by the use of the galvano-cautery in the course of some ten weeks. During the course of treatment, the orbit became invaded by a vascular new-formation, presumably of the same nature as the nasal tumor. This however, receded again spontaneously, and after the lapse of some three months, there remained no evidence of any orbital tumefaction.

The orbital congestion and tumefaction, together with the other disturbances which constitute *exophthalmic goitre* have in a few rare instances been entirely removed by the treatment of intra-nasal anomalies. The fact that there are but seven observations of this kind on record, shows that a nasal origin of this disease is a very rare occurrence. But the prompt disappearance of the symptoms—usually so persistent—of Basedow's diseases after nasal treatment in six [6] of the instances, is as decisive a proof of their dependence upon the nasal anomaly as any therapeutic test can furnish.[1]*

*Hopman. Deutscher Natuaforscher Congress 1885. reprinted in Berliner klinische Wochenschrift 1888, No. 42. Hack, Deutsche med.

In another striking case reported by Semon (*Internat. Centralblatt f. Laryngologie*, VI, p. 238) one-sided exophthalmus and palpitation of the heart were provoked by a galvano-caustic operation in the nose, but subsided after the lapse of a few days.

X. The most common ocular affections of nasal origin are the *sensory* and *functional derangements*. In my experience, I find that in every 100 patients applying on account of refractive anomalies or asthenopic complaints, there are about two to three instances with subjective symptoms curable by nasal treatment. The nasal origin of these symptoms can be proven only by the therapeutic test, for which there is a proper field whenever no cause for the complaints can be found in the eyes or their muscles. There is nothing characteristic in the history of these cases. The annoyance from the nasal trouble may or may not be slight. The development of the eye symptoms is generally gradual, but sometimes they occur in a more acute form during the acute aggravation of a preëxisting nasal disease. The anomaly causing them is most commonly some obstructive lesion in the nose often, though not invariably, associated with nasal irritability. A few times I have also seen marked ocular discomfort produced by subacute follicular inflammation in the tonsils or at the vault of the pharynx.

a. The eye symptoms described by authors [5 6 7 11 12 15 18 21 25 26 30 31 33 36 41] as of nasal origin, are itching, burning and smarting of the lids, shooting pains through the eyes, sometimes a heavy, full feeling, but not often an actual ache. Characteristic of the nasal origin is their presence immediately on awaking. Usually there are remissions in the severity of the annoyance during the day. Sometimes there is associated with this discomfort, more or less injection of the conjunctiva, even of the eyeball and lachrymation. The sensitiveness to light may be exaggerated to an extent causing tonic blepharospasm, but often, too, there is no photophobia or irritability.

The eye-discomfort due to nasal disease is in some persons not increased by use of the eyes. In others, however, all eye work intensifies the symptoms so as to render steady use of the eyes impossible. I have formerly[15] come to the conclusion that this asthenopia is of mixed origin. Most of the sufferers of this type show on examination some refractive or muscular anomaly. If this is corrected they can use their eyes with greater ease, but yet are not free from discomfort. If on the other hand, the nasal condition can be cured the patients enjoy comfort while they rest their eyes, but require their glasses for work. The cases published by De Schweinitz [41] seem to conform to this view. I do not think, however, that this combination of refractive (or muscular) asthenopia with nasal influence is accidental. It has seemed to me that the nasal influence renders the nervous system sensitive to a degree of eye strain, which normal persons with the same optic conditions can usually bear without discomfort. Some of my patients have indeed been able to drop their glasses without suffering some time after the cure of the nasal disorder.

There are, besides, other instances in which nasal lesions alone, cause typical asthenopia for work even in emmetropic persons. In my experience this type has not been common. A striking case has been reported by Kibbe.[42]

Hoffman[4] has called attention to asthenopia due to failure of the accommodation in persons with cheesy accumulations in the tonsils, and claims to have cured such patients by treatment of the tonsils. I have likewise been able to benefit a number of young persons by excision of the tonsils or destruction of the distended crypts. In my cases, however, I could not demonstrate an absolute diminution of accommodative power, as measured by the distance of the near point, but the strain or blurring on use of the eyes seemed to depend on an inability to maintain continuously the required accommodative effort.

b. Another functional trouble which in some instances seems of nasal origin is fugitive scotoma or blind headache. Hack[1] p. 36, describes two instances of this kind in which the spells of migraine with scotoma scintillans ceased after galvano-caustic destruction of excessive cavernous tissue in the nose. I have seen a number of instances in which a connection between such attacks, and the nasal condition was suggested by correspondingly one-sided obstructive lesions with irritative symptoms during the attack. But I have only had opportunity twice to satisfy myself of the persistent cessation of the blind spells after successful nasal treatment.

c. Blepharospasm can sometimes be traced to nasal influence. Persistent closure of the lids may result from the photophobia engendered by nasal disease, as reported in an extreme instance by Bettman,[12] or by suppuration of the maxillary sinus as seen by Nieden.[9] But cases also occur in which clonic spasms of the lids, or even chorea of the orbicularis and facial muscles, are stopped by the removal of nasal anomalies. Ziem[8] has seen such cases subsequent to the removal of enlarged pharyngeal or faucial tonsils. Jacobi (*N. Y. Med. Record*, January 30, 1886) has also called attention to the influence of nasopharyngeal disease in the production of facial chorea. Personally I have seen not very rarely chorea of the lids and of the face in children suffering from subacute rhinitis, in whom the gradual cessation of the muscular twitching in proportion as the nasal disease was improved can be considered positive evidence of the nasal influence. In some instances I have been able to demonstrate the nasal origin by means of the calming effect of a cocaine spray. In others, however, the experiment with cocaine, as well as the result of treatment, have led me to attribute the chorea to irritation proceeding conjointly from both morbid nasal and diseased conjunctival surfaces.

Two observations reported, the one by B. Fraenkel (*Berliner Klin. Wochenschrift*, No. 22, 1884), the other by Peltesohn (*Berl. Klin. Wochenschrift*, No. 32, 1891), show that even typical one-sided tic spasmodic, involving the orbicularis as well as the other facial muscles, may be a reflex of nasal origin.

d. The possibility of reflex contractures of ocular muscles in consequence of nasal lesions is illustrated by a singular observation published by Quinlan,[37] in which convergent squint occurred after a fracture of the nasal septum, lasted ten years, and disappeared spontaneously after operative correction of the deflected bone.

Wochenschrift 1888 No. 25. Fraenkel, B., Berliner klin. Wochenschrift 1888, No. 6. (Goitre and cardiac symptoms without exophthalmus.) Stoker, Internat. Centralblatt f. Laryngologie, V, p. 579. (Two cases.) Musehold, Deutsche med. Wochenschrift, 1892, No. 5. (Goitre and cardiac symptoms, no exophthalmus, but one-sided ocular pain, cured by removal of a small hypertrophy from the rear end of the inferior turbinated body.)

In trying to answer the question how nasal disorders can lead to these eye symptoms and lesions, we must take into account four possible modes of causation:

1. Processes of growth cause the extension of tumors through the sinuses into the orbit or into the cranial cavity. Hypertrophies also may involve mechanically the nasal end of the nasal duct.

2. By extension of infection through lymph vessels, through foramina or deficiencies in the bony walls, or along continuity of surface, inflammatory processes may pass from the nose into the orbit, may reach the intracranial portion of the optic nerve, or may creep into the lachrymal sac. Clinical observation shows that this spread of infection is favored by narrowness of the nasal passage, or by obstructions interfering with the drainage of pus.

3. Circulatory disturbances may occur in the form of venous congestion whenever mechanical conditions exist in the nose which impede the circulation. This is particularly the case in nasal obstructive lesions. We can often see the resulting stasis in the form of dark venous rings around the lids, and in the congestion of the edges of the lids. The anatomical conditions which determine the involvement of the orbital and palpebral veins in nasal disturbances are the anastomoses between these vessels and the veins of the nose, which connections vary in different subjects. Besides the passive venous engorgement, there may occur active congestion of the conjunctival, and perhaps also of the intraocular vessels, in connection with acute or irritating nasal inflammations, comparable to the congested zone surrounding any inflammatory focus. Both the active and the passive vascular disturbances are probably accompanied by interference with the lymphatic circulation. That this disturbance of nutrition should reduce the resisting power of the ocular tissues to accidentally present germs, is a presumption supported by many pathological observations.

4. Lastly, the nasal influence may consist in nervous disturbances—the so-called reflexes. This is evidently the mode of production in blepharospasm of nasal origin, and in abnormal lachrymation. Vascular disturbances may also be of reflex origin, as can be demonstrated by irritating the nasal mucous membrane in sensitive persons, or by extracting a hair at the entrance of the nose. Some of the sensory derangements of the eye are likewise due to the irritation of the sensory nerve of the nose, a proof of which can sometimes be given by the calming effect of nasal spray of cocaine. To call them reflexes, however, is a misuse of a physiological term. A better name would be sensory neuroses of peripheral (*i. e.*, nasal) origin.

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HETEROPHORIA AS A CAUSE OF ACUTE RHINITIS, LOSS OF SMELL AND TINNITUS AURIUM.

Read in the Section of Ophthalmology at the Forty-third annual meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY LEARTUS CONNOR, M.D.,
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That diseases of the nares affect the functions of the eyes unfavorably in many directions, is a well accepted fact the confirmations of which are numerous and constantly increasing. In some ways it has been recognized that disorders of the eyes disturb the functions of the nares. Thus all those eye diseases that increase or diminish or render ichorus the secretion of the conjunctiva and lachrymal glands, definitely modify unfavorably the functions of the nares, often exciting severe inflammations which can only be relieved by the abatement of the disordered secretion, or the rendering of it normal in quantity and quality. Farther, it is a matter of record that defects of refraction by inducing disorders of the conjunctival secretions modify the functions of the nares in many important particulars.

Thus a disorder of the eyes may originate in a disorder of the nares, and a disorder of the nares may originate in a disorder of the eyes. My purpose is not a discussion of these intercurrent relationships in general, but to present a single observation upon a single point among these relationships. By this I hope to show that in one instance a condition of exophoria uncomplicated with any other discernable abnormality did induce an acute rhinitis, a loss of the sense of smell, a tinnitus aurium, and a general nervous prostration. The instance I give briefly.

On July 24, 1891, Miss G. H. applied to me for relief from severe and frequent attacks of acute rhinitis, tinnitus aurium and loss of smell. She was a strong healthy appearing woman, single, a type writer by occupation, and twenty-eight years old. She said that aside from these troubles she had never been sick, and had been able to follow her calling during the past twelve years without scarcely a vacation. Her troubles began very gradually, but she was able to show that they had existed for at least a

year and a half previous to July 24, 1891. First she suffered only from the attacks of rhinitis. After about six months she noticed a loss of sense of smell, and about seven months later the tinnitus aurium. The constitutional disturbance attending the attacks was slight at first, but had gradually increased in intensity until it had become so severe as to almost incapacitate her for work. The attacks of rhinitis occurred at somewhat irregular intervals, averaging about one a week and lasting from two to four days. During the attacks there was a constant flow of watery fluid from the nose, compelling her to keep a handkerchief to her nose nearly all the time, and thus seriously interfering with her work. To provide a receptacle for this fluid from half a dozen to a dozen handkerchiefs were needed daily. With the fluid was more or less mucous and some little pus. The character of the fluid or the mechanical results from wiping the nose produced a great amount of excoriation about the vestibule of the nose. During these attacks the mucous membrane of the nose became red, rough, sensitive and the turbinated bodies so swollen as to quite occlude the nasal passages on one or both sides. Sometimes one nostril would be most affected, and sometimes the other, and again both.

Accompanying these attacks was great and indescribable general distress which continued for a time after the attacks disappeared. No external condition seemed to have any effect upon this onset or departure. They were as frequent during fall and winter as during spring and summer. Foul air, dust, emanations from flowers or vegetable matter did not seem to interfere with them in any particular.

They were, however, increased in frequency and force by over work and over heating.

An examination at first visit showed a condition of the nares identical with that already described. The sense of smell was entirely absent. The hearing for R. E. was $\frac{1}{48}$, for L. E. was $\frac{6}{48}$ as tested by watch. The tuning fork and Politzer's acumeter gave similar results. The membrana tympani of either side exhibited the characteristic appearances of chronic non-suppurative otitis media plus an acute attack of inflammation of the middle ears, as shown by a red line along the handle of the malleus, lack of lustre, and diminished mobility. Her eyes were not examined, for the reason that she gave no symptoms referable thereto. She had for a year and a half previous to my seeing her, been under the care of an expert in diseases of the nose and throat, but without appreciable relief, in fact she had steadily grown worse in all respects.

Regarding the case as one of recurring attacks of acute rhinitis extending to the mucous membrane of the upper pharynx, Eustachian tubes and middle ears, I managed it accordingly. The greatest relief was obtained by the application to the engorged mucous membrane of trichloro-acetic acid. This clearly shortened the attacks and lessened their severity, but they still recurred, and the attending disability of hearing, loss of smell, and tinnitus remained. No modification of her time or place of work, or other changes in her mode of life suggested by the circumstances produced any marked improvement.

Finally it occurred to me that in spite of the fact that she did not complain of her eyes or head, and did her work with ease when not suffering from the attacks of rhinitis, that a waste of nerve energy would be prevented by the correction of her exophoria. She would not consent to an operation upon the stronger tendons, so that recourse was had to prisms. On Feb. 12, 1892, I gave her to wear before each eye, a prism of three degrees. This was but a partial correction of her exophoria, but it added to her comfort so markedly, that in a few days they were increased to four degrees, and a few days later to six degrees. This corrected her exophoria to within a half a degree. There was no hyperphoria, nor any defect of refraction, her vision being normal in all respects.

The effects of wearing these prisms may be briefly stated. Without any local treatment of her nose she had no return of her trouble for a couple of weeks. This was so peculiar that she was requested to lay aside the prisms. The result was a prompt attack of rhinitis of the old type. She was then permitted to resume the wearing of the prisms, and will not part with them because convinced of the relief they afford her. To date of writing, some three months, she has been entirely free from these attacks. Gradually the tinnitus diminished, until for the past two months she does not recognize it. Even attacks of ordinary cold do not affect her differently from other persons. Her hearing has increased in her R. E. to $\frac{18}{48}$, and in her L. E. to $\frac{10}{48}$. The membranes of the ears have assumed a more healthful appearance. Her sense of smell returns more slowly, but it is surely increasing. Her habits and mode of life have remained as they were during the local treatment to the nares and ears. The most careful scrutiny of this case fails to reveal any other cause for the attacks described, than the exophoria.

In conclusion it is to be noted:

1. An exophoria of twelve degrees uncomplicated with any other deformity or disability of the eyes did produce and continue for more than two years a most distressing affection of the nares.

2. Indirectly this exophoria caused loss of smell, tinnitus aurium and deafness, with great nervous prostration.

3. In one such case the correction of the exophoria by prisms aggregating twelve degrees produced immediate relief which has continued during two months and more.[1] It also indirectly cured the tinnitus, increased the hearing, and the sense of smell.

4. There is no reason to deny that in another case the disturbance induced in the nerve centres by an exophoria, may not attack other organs or apparatuses, and induce in them effects similar to those we have seen induced in the nares and adjacent structures.

AN OPERATION FOR THE RADICAL CURE OF STRICTURE OF THE LACHRYMAL DUCT, WITH DESCRIPTION OF A STRICTUROTOME.

Read in the Section of Ophthalmology at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY CHARLES HERMON THOMAS, M.D.,
OF PHILADELPHIA.

All those who have busied themselves with the surgery of the lachrymal passages must be aware that surgeons have not agreed upon a satisfactory method for the treatment of stricture of the lachrymal duct. With respect to the possibility of radical cure, the

[1] Sept. 1, 1892.—As this article was being corrected, an examination of the case showed a continuance of the improvement described; this covering a period of nearly six months.

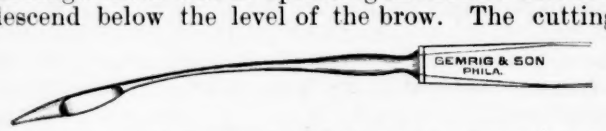
attitude of many is one of discouragement, perhaps even of disgust. Of all procedures in use, none is so generally employed as dilation by probes. But the length of time which this method of treatment requires, the amount of trouble it involves, together with the uncertainty of permanent good results, all of which its adherents admit, make it very desirable that some more effective procedure be adopted.

Influenced by the results obtained by French surgeons in internal urethrotomy, Dr. Stilling, then of Hesse-Cassel, published a brochure in 1868,[1] detailing a new method of treating stricture of the lachrymal passages by internal incision, an operation devised by him and which he was the first to make effective. My attention was at once attracted to this paper. The operation strongly appealed to me as a promising one, and correct in principle.

But I believed that the instrument which he proposed was not altogether well adapted to the purpose for which it was intended. In the first place, the knife being short, straight and rigid, is not readily applicable to the bony canal, entrance to which, moreover, is more or less impeded by the overhanging brow, an obstacle which all who have attempted to pass a straight Bowman's probe have doubtless encountered. Then the rounded cutting point and tapering blade, broadest where it joins the shank, make an instrument which one might naturally shrink from introducing into such a passage.

To meet these apparent objections, I devised an instrument which was made for me by J. H. Gemrig & Son in August, 1869, and which has been subjected to the test of use in my own hands, and some others, during the more than twenty-two years which have followed. The results have been so wholly satisfactory as to lead me to welcome the invitation of the Chairman to present the subject here; especially as I have delayed publishing any account of the matter till now.

The instrument consists, besides the handle, of shank, blade, and tip. Its length, exclusive of the handle, is 5½ centimeters. The shank is of untempered steel, to give it flexibility, and is 4 centimeters in length. The flexibility of the shank is such as to permit the instrument to be bent into any curve found convenient for introduction into the canal and its length such that in operating the handle does not descend below the level of the brow. The cutting



blade is 7 millimeters in length and 3 millimeters in width, the whole terminating in a conical tip, blunt at the point, and equal to the blade in length, thus forming a probe, dilator and knife combined. The conical tip serves at once as a guide and a dilator for the cutting blade which follows, and also as a protector of the soft parts during the introduction and withdrawal of the instrument. A considerable experience in urethral surgery, and especially in internal urethrotomy on my own part, had prepared me to regard Stilling's insistence on the analogy between stricture of the urethra and of the lachrymal passages as in the main justifiable; and, I may add, as a false passage in the surgery of the urethra is, under all circumstances, to be sedulously avoided, so in the treatment of lachrymal stricture, like considerations are applicable, and like care is to be exercised. And as in operation for stricture of the urethra by internal urethrotomy incision is properly preceded by dilatation, not as a method of cure, but as a necessary preliminary to the entrance of the cutting instrument into the lumen of the canal, so in incision of coarctations of the lachrymal passages, like precautions should be taken, allowance being made for the difference of structure in the two cases.

From this point of view Stilling's knife appears to be defective; there is no certainty that its rounded cutting-end will enter the narrowed lumen of the duct, and that the downward thrust may not carry it through the tissues alongside of the true passage, and thus force a false one. And a false passage once made, the subsequent incisions taking their start therefrom, may result in the formation of a canal whose wall being devoid of mucous membrane, shall consist of cicatricial tissue throughout. This danger is obviated by the conical tip of the stricturotome here described, serving, as it does, to guide the blade safely into the lumen of the duct, and to dilate the strictured part, so as to allow of the blade's easy passage through and beyond it.

From the foregoing it is clear that, while the initial incision with the Stilling knife is necessarily made as a thrust with a cutting pointed instrument without a guide and is, therefore, to a considerable extent a chance thrust in the dark, the incision with the stricturotome here proposed is a draw-cut from beyond the stricture upward and through it. The incision in the latter case is made at a definite point of selection, the seat of the stricture, and the instrument is at all times under perfect control and ready to be used either as an exploring, dilating or cutting instrument, as the exigencies of the operation may require.

In operating, the first step consists in slitting the canaliculus, the lower if a style is to be used, otherwise the upper. This is accomplished more conveniently with a small grooved director and Beer's knife than with Weber's knife. In making this incision, two points are to be observed: the cut is to be made along the inner edge of the lid, the edge of the knife being directed somewhat backward and toward the eye, so that the groove formed may be in a favorable position to receive the tears; and the opening into the sac must be made sufficiently large to permit the free entrance of the necessary instruments. This latter may be best accomplished with the point of the knife, before the director is withdrawn. An obstructing ledge of tissue is usually found at the inner end of the groove, formed from the lower canaliculus, which offers an impediment to the passage of instruments, and even of tears. This obstruction may be divided later by the stricturotome, during its withdrawal at the close of the operation.

A Bowman's probe, or better still, the flexible probe of Dr. Williams, of Boston, is now to be inserted to explore the canal, and to note the location and calibre of the first stricture encountered. The probe being withdrawn, the stricturotome, well oiled, is introduced, special care being taken to place the point of the instrument within the grasp of the stricture. Strictures impermeable to ordinary probes, and which allow only the passage of an Anel's probe, will be found permeable to the conical tip of this instru-

[1] Ueber die Heilung der Verengerungen der Thränenwege mittelst der Innern Incision. Cassel, 1868.

ment. The tip being engaged in the stricture, gentle continuous pressure is to be made, and the cone carried through and beyond the coarctation. It cannot be too strongly insisted upon that exploration of strictures in this locality is to be conducted with extreme deliberation and patience; all instruments should be introduced by coaxing, and not by force. More than one sitting may be necessary to complete the exploration. The blade having been passed into the free space beyond the stricture, incision is made by a drawing movement upward, completely dividing the tissues at the strictured point, even to the bone, and in at least two different directions. The instrument should then be moved laterally in all directions, to make sure that no narrowing remains; and before withdrawal it should be carried within the nasal fossa as an exploring instrument, to learn if any other stricture be present, and which if found, should also be incised. By far the most common seat of stricture of these passages is at the junction of the sac and duct; only occasionally will a stricture be found at the nasal extremity of the duct. A little bleeding at the nose and at the inner canthus are the only external indications that an operation has been performed. The whole operation is singularly free from pain, and with cocaine the pain becomes quite insignificant.

Stilling, and those who have used his instrument, describe more or less considerable hæmorrhage from the nose and ecchymosis of the lower lid as the ordinary results of operation, due, no doubt, to the somewhat extensive and unnecessary cutting of healthy structures, which unavoidably attends the use of such a knife as his, but which conditions do not exist in the operation as here described, the incision here being limited to the parts affected.

As regards after treatment, I have usually introduced a large leaden style, measuring 8 to 10 millimeters in circumference with the upper extremity bent at a right angle, and so reduced in size as to drop into the open groove formed of the divided lower canaliculus, where it lies concealed. This is removed at first every day or two while the passage is washed; after the first ten days it need not be disturbed for a week or more at a time. At the end of a few weeks the style may be removed altogether.

Stilling insists that all after treatment, looking to the mechanical separation of the parts with a view to preserving the space gained by the incision, is not only needless but even harmful, in consequence of the subsequent inflammation said to be thus produced; and he therefore discountenances the use of either probes or styles under such circumstances. With this conclusion, however, my experience does not agree, provided that not a vestige of the stricture remains uncut, and that the passage be so large that the style goes loosely into place. Under these circumstances I have found that the style at least does no harm, while in some instances, where the parts are swollen and the cut surfaces are thus kept in apposition within the bony canal, it is likely to prove effective in keeping the several parts asunder. With patients who cannot be under frequent observation, this may prove an important safeguard.

When the style has been removed after several week's wear, and when on replacing it after an interval of a week or two, it is found to pass without impediment, we are safe in declaring that a cure has been effected. Experience in after treatment both with and without the style, leads me to believe that while success is likely to attend both methods, the use of the style, under the conditions noted, is, on the whole, to be preferred.

Although Stilling's operation has been noticed by writers of good reputation in Ophthalmology, from the time it was first introduced to the present day, it appears to have failed so far as England and America, at least, are concerned, to receive the general acceptance which its early promise and its great merits deserve.* Thus, while Soelberg Wells and R. Brudenell Carter both called attention to it—though without definite commendation—in the year following its introduction, Swanzy, in a recent edition of his "Hand Book", after describing the operation, says: "This method has never gained much popularity"; and Berry, in his "Diseases of the Eye", ignores it altogether. To these may be added in this country de Schweinitz, in whose recent work it is accorded scarcely more than a passing mention.

The chief reason of this indifference is probably to be found in the unmechanical and even formidable character of the knife which Stilling figured. Beside this, it was difficult for surgeons to adopt what appeared to be extreme views as to the necessity of abstaining from all after treatment, and upon which he strongly insisted.

The instrument here presented, in connection with the plan of after treatment recommended, is designed to meet these objections. If I shall succeed in getting thorough trial for the operation with the modifications here outlined, from the members of this Section, I am confident that it will, with you at least, supplant the use of probes, and take its place as the most useful and satisfactory method known for the treatment of an affection at times dangerous to the integrity of the eye and often annoying to both patient and surgeon.

As regards those cases in which operation within the duct is determined upon, there is practically but one method now in general use with which a comparison with stricturotomy can be made, and that is the treatment by slow dilation through probing. As between stricturotomy and probing, the superiority of stricturotomy will, I believe, be manifest to anyone who will make trial of the two methods. Stricturotomy promises immediate relief and radical cure, while probing is tedious, painful, usually dilatory, and often finally, ineffectual.

Weber's canaliculus knife, somewhat modified, has also been used for the incision of coarctations situated within the duct. At least two American surgeons have so employed it with the addition of a long shank. While this shank is unquestionably an improvement, if the knife is to be used within the duct at all, in my judgment, this knife, even so modified, is hardly less objectionable than the original Stilling knife. The probe point, in these instruments, as I have seen them, appears to be inadequate to serve either as an efficient guide or dilator and if in use it should fail to engage properly within the lumen of the duct, and a false passage is produced, the re-

*The same appears to be the case in France. Since my article was written, a paper in the "Recueil d'Ophthalmologie" for May, 1892, by Dr. Chouvel, surgeon-in-chief of the French army, gives the result in fifty cases of lachrymal obstruction by probing. He concludes as follows: "It has seemed to us that it is not without utility to make known the little success which slow and progressive dilatation has yielded in our hands, seeing that this method of treatment is the one which thus far has the most adherents."

sult will be a lacerated instead of an incised wound, which latter at least would be made by Stilling's knife under similar circumstances.

Stricturotomy is, of course, not recommended for every case of epiphora, nor yet for all cases of dacryocystitis. In this connection should be mentioned the simple and ingenious suggestion of Dr. George M. Gould, of Philadelphia, who reports[2] having obtained good results through a method by which the patient himself is enabled to wash out the tract with an antiseptic or astringent lotion, with the intervention of a syringe. I have adopted this method in one case with strikingly good results, and believe that in certain cases it may properly supplement, and in others, supplant, operative or other treatment.

As long ago as 1867, Stellwag[3] called attention to the causal relation between disease of the nasal fossæ and antrum and of affections of the lachrymal passage, and advises general and local treatment of any morbid condition found, such as ozena, polypi, or other new growth within the nose or antrum, chronic inflammation of the Schneiderian membrane, etc., and quite recently, good results have been reported by de Schweinitz[4] in epiphora by a systematic examination and treatment of the naso-pharynx. When all has been done however, that can be effected by the rhinologist, a considerable proportion of cases will doubtless remain, which will continue to demand the services of the ophthalmologist.

I quote the following from R. Brudenell Carter written in 1869,[5] calling attention to Stilling's method, and depicting the state of the art at that period: "It is well known that lachrymal obstructions depending upon strictures of the nasal duct, below the sac, are often of a very obstinate character. In some cases, when the canaliculus has been slit up, and Bowman's largest probe passed through the stricture, the difficulty is soon overcome. In others, and I think they form a majority, the stricture soon closes again, and the malady becomes as troublesome as ever. All manner of devices have been tried in vain; and such patients become a source of unmixed weariness at the hospital, and of weariness, mitigated by guineas, in the consulting room. Catgut probes, laminaria probes, injections of all sorts and in all quantities, styles to be worn temporarily, styles to be worn permanently, form only a few of the resources that have been tried, sometimes successfully, but yet with frequent failure, even in skilful and practiced hands. And, if these probings and manipulations were ever performed unskilfully, it could scarcely be expected that benefit would be derived from them."

This somewhat picturesque statement has additional interest, serving to bring home to us as it does, how little progress has been made since that time. Besides, Berry,[6] in his work, thus expresses himself:

"When a stricture exists at the orifice between the sac and the duct, the patient may, after it has been dilated, be taught to pass the probe himself, or, as recently been suggested, and practiced by Benson, he may introduce pewter styles every night, removing them again in the morning. By prolonged treatment of this nature, more or less improvement is generally eventually obtained, but there are always some cases in which this is not the case; in such it is necessary to have recourse to destruction of the sac altogether. . . . . An attempt may always be made to dilate the stricture by the introduction of the probes at intervals of a few days, or by causing the patient to wear styles, but the results are often unsatisfactory; fortunately such cases are comparatively rare."

The following case, from a series reported by Warlemont,[7] may be taken as typical, and well illustrates the striking contrast between treatment by probing and that by stricturotomy.

Mathilde D., æt. 20, has suffered for several years from epiphere of the left eye, for which she was treated by catheterization by Bowman's probes for more than three years (sic). A stricture was found at the upper extremity of the nasal duct, and another at its lower end; probe No. 4 was passed into the nose, but not without difficulty. For the last three years, this young and pretty girl, with a constancy worthy of a better lot, has come once or twice a week to have the sound passed; the tearing persists, and mucous shreds are seen to escape from the upper punctum, long since incised, on making somewhat forcible pressure over the sac. In short, the cure threatens to be long delayed.

June 4. Stilling's operation. Incision of strictures made with the greatest care. Nasal hæmorrhage.

June 10. The patient declares that she is better than she has been for three years; no more tearing nor accumulation of mucous in the sac. The slight conjunctivitis which has existed for a considerable length of time has disappeared.

Oct. The cure is complete, and has remained so for the five months she was under observation.

Within the past few days, it has been my good fortune to have an opportunity of examining the first patient upon whom I operated by this plan, now somewhat more than 22 years ago. This lady, who suffered from stricture of the duct, causing dacryocystitis and epiphora, has been perfectly well from the time of the operation to the present day. Pressure over the sac shows no trace of regurgitation, and a large Bowman's probe is readily passed without encountering the least indication of stricture.

Another case illustrating the serious consequences which occasionally follow from lachrymal disease, and the excellent results obtained by stricturotomy, is that of a gentleman from Virginia, sent to me by Dr. Conger, of Oswego Co., New York. He had been under treatment by specialists in three of the principal cities of the country, and for periods varying from 3 to 6 months at a time. He had severe chronic conjunctivitis, dense pannus, with hardly more than light perception, the iris being totally concealed from view. The condition in both eyes was the same, so that he was quite blind and had to be led. He was a business man, and had been compelled to give up his business. After several months of varied but almost futile treatment, I still advised him to remain under further observation, with the hope that a clue might be found that would lead to his relief. During this time he was seen in consultation a number of times by my friend, the late Dr. R. J. Levis. The patient reported that he occasionally found yellowish "worm-like threads" in his eyes, especially on awaking in the morning. My attention having been attracted by this, I was one day led to make a more than ordinarily careful examination of the entire conjunctiva, when, on casually making pressure over the lachrymal sac, I observed a spurt of yellowish muco-pus issuing from both upper and lower puncta of both eyes, which led me to believe that I had found the source of the irritant upon which the disease de-

[2] Journal Amer. Med. Assn., April 23, 1892, p. 529.
[3] Lehrbuch der praktischen Augenheilkunde, 3d Edition.
[4] Journal of Amer. Med. Assn., Apr. 23, 1892, p. 526.
[5] The Practitioner, Vol. 2, 1869, London.
[6] Diseases of the eye.
[7] Annales d' Oculistique, Oct., 1868.

pended. I slit up the lower canaliculi at once, and incised strictures found at the junction of the sac and duct. The good effect was manifest almost immediately. Within six weeks from the time of the operation, I received letters from him, written at his home, in his own handwriting, informing me that he had resumed business, and was able to read coarse print. It is worthy of note that there had been neither epiphora nor swelling in the region of the sac, nothing in fact to call attention to the lachrymal difficulty. I continued to hear from the patient up to the time of his death, which occurred some years later. The good results persisted; his visual acuity improved still further, and in short, he regarded himself as a well man.

In forming an estimate of the relative value of the two methods under consideration, it is to be observed that by both, a permanent enlargement of the calibre of the duct is the object sought to be attained. In both, increased calibre can be secured only by structural changes in the walls of the duct. But in each, totally different principles as well as procedures underlie the results aimed at. By the process of probing—gradual dilation—the change is sought to be effected through absorption of the tissues forming the stricture, by means of the pressure of the impinging probe, with a redisposition of new tissue elements to compensate for the increased size of the duct. Such a process is slow and tedious at the best, and finally uncertain in its results, and for these reasons practically unavailable. Stricturotomy, on the contrary, at once effects an enlargement of the canal, giving the reasonable expectation of its permanent patency. It may be added that while the canal, as produced by stricturotomy, may be larger than is necessary for the performance of the normal functions of the part, it is certain that the space provided by probing is usually altogether deficient in size. The larger size, in the one instance, however, does no harm, while the small size produced in the other results in the failure of the operation.

In the light of all the facts, I feel warranted in stating my belief that probing as a method of treatment should be discarded. And, also, that stricturotomy, as here described, based as it is upon sound surgical principles and supported by experience, should be substituted for it, and all other instrumental procedures now in use for the treatment of stricture of the lachrymal duct.

Lachrymal stricture treated by this method has, in my hands, during many years, yielded results as satisfactory as those following operation in other parts of the body.

CLOSURE OF THE LACHRYMAL PUNCTA IN DACRYOCYSTITIS AS A BARRIER AGAINST INFECTION OF THE WOUNDED EYEBALL.

Read in the Section of Ophthalmology at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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That an unsound condition of the lachrymal sac and duct is a constant menace to the eyeball and, in fact, the most mischievous source of infection, is admitted by everyone familiar with the subject. The pernicious quality of the secretion in dacryocystitis is caused by the copious existence of microörganisms of many varieties, and with the exception of the gonococcus, none are known to be more hurtful to the tissues of the eye. The rule is therefore strictly observed, not to operate for cataract, etc., before any existing lachrymal trouble has been eliminated. Even the slightest corneal wound affords a favorable point of entrance for the virus,and hypopyum keratitis with all its dangers results. The striking fact has been proven that from 20 per cent. to 32 per cent. of the cases of hypopyum keratitis are complicated with dacryocystitis.[1]

As a rule, a person afflicted with some disease of the lachrymal apparatus passes many years of his life without any further annoyance than a constant overflow of tears, which necessitates the frequent use of his handkerchief, and a discharge of muco-purulent secretion, which causes a sticking-together of the lids in the morning. Then, by accident, some foreign body produces an abrasion of the corneal epithelium, and the opportunity for infection is given. At first the eye becomes injected and inflamed and a small yellow spot with ulceration forms at the site of injury. Frequently it is not made much of until pain supervenes, the violence of which induces the patient at last to seek medical aid after several days have elapsed. The physician, frequently overlooking the lachrymal trouble, prescribes cocaine and hot fomentations with some antiseptic wash—but the eye grows worse from day to day. While the ulcer increases in size a yellow precipitate forms at the bottom of the anterior chamber; and it is often only at this stage, after the hypopyum has developed, that the oculist is consulted. It has been my experience to see the great majority of cases for the first time from ten days to three weeks after the injury had been inflicted. Speedy action is now demanded. Sometimes it is still sufficient to thoroughly scrape the floor of the ulcer, dust it with iodoform and to frequently flush the eye with a 1 to 2,000 sublimate solution, to which the use of hot fomentations is added when there is much pain. Cauterization of the ulcer, however, usually proves more beneficial, and it is now generally admitted to be the best means of destroying the germs and bringing about absorption of the hypopyum. But even this will frequently not obviate the necessity of a paracentesis or a Sæmisch operation. Only after the pus has been evacuated and the necrotic tissue eliminated does healing often begin, and after several weeks the eye recovers with a more or less large leucoma. But there is still a number of cases (according to different statistics from 9.5 per cent. to 19.2 per cent.[2]) especially in old and debilitated persons, where, in spite of the above treatment, the ulcer increases, staphyloma forms or the whole cornea is ravaged, and suppuration extends to the interior of the globe. It has appeared to me that, while all these active measures are being directed against the pus in the eyeball, sufficient attention is not paid to the source of infection, viz., the lachrymal apparatus. All our efforts may be entirely neutralized as long as there is a chance of renewed entrance of infectious material. To be sure, it is generally advised to add treatment of the sac and tear duct, to slit the canaliculus according to Bowman's teachings, to pass the probe and syringe the duct with antiseptic lotions. But

1 Noyes, Diseases of the eye, page 366.
2 Noyes, loc. cit.

we all know how long it often takes to cure dacryocystitis, if it can be cured at all, and before this is accomplished and the last pus germ eliminated, the eye may be destroyed. Even though we freely open the tear sac, evacuate its contents and treat its surface with strong antiseptic solutions, the source of trouble may be further down in the duct, or even in the nose. The importance of attention to intra-nasal lesions in obstructive disease of the lachrymal apparatus has recently been emphasized by Dr. de Schweinitz[3] in a paper read before the Philadelphia County Medical Society. A number of cases are cited where intra-nasal treatment was necessary to cure the lachrymal trouble. But this also requires considerable time, whereas the infected corneal ulcer calls for speedy action. With regard to obliteration or excision of the lachrymal sac, it must be admitted that it would be the most efficient means of eliminating the virus. But it is quite a violent and painful operation, not to mention the time required for healing, so that the patient, now weak and debilitated by constant suffering, would hardly agree to submit to it. The question has, therefore, presented itself to me, if it were not feasible, after disinfecting all implicated parts in the best possible manner to quickly and effectually close the lachrymal puncta. Could this not be accomplished, at least temporarily, until the danger is over? Allow me to make my answer by shortly citing a few cases:

Case 1.—Mr. W. V., 63 years old, farmer, ten or eleven days ago while cutting corn something, probably a particle of a blade of corn, got into his right eye. It pained him at once and he tried to rub it out. The same eyeball had been inflamed twice before but recovered in a few days. As then, he made cold wet applications during the night and felt better in the morning. But the following day the soreness returned and gradually grew worse. In spite of several home remedies the increased pain began to extend to the forehead, temple and right side of head. Noticing, after a week, that the eye had almost completely lost its vision, he came to Wheeling and consulted Dr. I. P. Birney. The doctor at once applied cocaine and antiseptics, telling him the eye was probably lost, and on the following day, October 6, 1891, sent him to me. I found an extensive infiltration of the central portion of the cornea, in the centre of which was a small wound covered with pus. About one-third of the anterior chamber was filled with hypopyum, and on pressure over the inner angle of the eye a large drop of thick muco-pus gushed from both puncta. The man was very feeble and debilitated, as he had suffered intensely and not slept for three nights and days. I first thoroughly flushed the conjunctival sac and eyeball with a corrosive sublimate solution 1 to 3,000 and tried to empty the lachrymal sac as much as possible by pressure. After the instillation of cocaine and atropine I introduced a fine Bowman probe through the lower canaliculus, without slitting the latter, and a stricture was detected about half-way down the duct. After thoroughly washing out the sac and duct, as far down as possible, with a pyoctanin solution 1 to 1,000 by means of Anel's syringe, I scraped the floor of the ulcer and dusted the whole with iodoform. The existing chronic nasal catarrh was properly attended to and the usual directions given for home treatment. The following day less pain was reported, but the ulcer and hypopyum had increased somewhat, so I cauterized the former extensively, after which, for the next two days, it seemed to get smaller and pain less severe. While the treatment of the sac was constantly continued the discharge became gradually of a less purulent and more mucous nature looking exactly like the white of an egg. The hypopyum did not diminish, however, and the patient still had some severe spells of neuralgia. So I decided to make a Sæmisch operation. After the aqueous had slowly flowed off I managed to remove the hypopyum with an iris forceps. But in spite of all antiseptic precautions the corneal wound did not close, and after two or three days I found a yellow infiltration of its edges and pus beginning again to accumulate in the anterior chamber. While I was preparing to cauterize the edges of the wound, it occurred to me to go further back towards the source of the trouble and see if I could ward off the lachrymal discharge by closing the puncta with the electro-cautery. After injecting cocaine, I pushed a fine wire about ⅛ of an inch through the puncta and closing the current, brought the point to a red heat, which after a few seconds was slowly withdrawn. My expectations were realized, as the resulting burn of the mucous lining brought about a firm adhesion of the walls of the canaliculus. That the connection between the lachrymal and the conjunctival sac was now entirely interrupted was proven the following morning, when I found a slight swelling over the site of the lachrymal sac, light pressure upon which did not drive any discharge through the puncta. The corneal wound had a better aspect and under antiseptic applications the beginning hypopyum disappeared in another day. Repair began and the eye rapidly mended, while, at the same time, the swelling of the lachrymal sac increased very slightly. A week afterwards, thinking the corneal wound sufficiently closed, I reopened the lower punctum with a pointed probe and evacuated the accumulated mucous. The patient left for home the following day in good spirits, not caring about any further treatment of the lachrymal duct and nose, which I had advised. I have since learned that in spite of a large leucoma, the eye has regained a small amount of vision.

Case 2.—A. H., 42 years old, of Kingwood, W. Va. February 6, 1892, he was working on his farm with a hoe, when his right eye began to pain him; but he does not remember having been wounded. The same evening inflammatory symptoms became worse, and pain and headache continued to increase from day to day. He was treated at home for two weeks, and then came to Wheeling, when he was at once referred to me by Dr. Ackerman. Diagnosis: Advanced hypopyum keratitis. Small corneal ulcer at the inner quadrant, and the anterior chamber at least half full of pus. Profuse purulent discharge from both puncta, which the patient said had existed for many years without giving him much trouble, as he had always been able to empty the sac by squeezing its contents into the nose. The same treatment was at once instituted as above, only that I was able to syringe the whole duct, the antiseptic fluid escaping from the nose. The following day both puncta were closed with the red-hot wire, and a Sæmisch operation performed, which entirely evacuated the pus. The eye began to recover at once without any accumulation of muco-pus in the sac, as the patient was directed to keep it empty by frequently squeezing the contents into the nose. During that time it was peculiar to notice an increase of discharge from the puncta of the other eye. After ten days I reopened the lower punctum, and the patient, anxious to return to work, left for home after a sojourn of a little over two weeks. The resulting corneal scar was comparatively small, and he promised to return soon for further treatment of the lachrymal trouble. His physician has recently written me that his eye is doing well, epiphora being noticed only at times.

Case 3.—M. M., 48 years old. While breaking limestone, he noticed that his right eye became painful, and the following day vision had considerably diminished. He was compelled to quit work, and, as the pain increased, he came to see me May 1, 1892, five days after the first symptoms. I found an ulcer in the centre of the cornea, with surrounding gray infiltration. Slight degree of dacryocystitis, but no hypopyum. I cauterized the ulcer with the hot wire, closed the lachrymal puncta, prescribed hot antiseptic compresses and atropine, and the eye was well in less than a week.

With regard to the means of interrupting the connection between the diseased lachrymal passages and the conjunctival sac, I remember having read the description of a clamp which would tightly compress the canaliculi. But I have not had sufficient faith to try it, considering that the pus cell will manage to creep through the smallest aperture. Prof. Eversbusch[4], of Erlangen, recently reported a method by which, in cases ready for cataract operation, where there was suspicion of a diseased condition of the lachrymal passages, he had closed both canaliculi with catgut ligatures. He declared thereby to have prevented all possibility of infection, which was proven by the good results obtained. The electro-

[3] Journal of the Am. Med. Ass., April 23, page 526.

[4] "Ueber die Anwendung der Antiseptica in der Augenheilkunde," Centralblatt für Augenheilkunde, December, 1890, p. 354.

caustic closure of the puncta, however, appears to be much simpler and surer.

Shortly after discharging Case 1, I found in the *Centralblatt für Augenheilkunde* the review of an article by Prof. Haab,[5] of Zurich, in which he describes a procedure of closing the lachrymal puncta with the galvano-cautery, to prevent infection, before operating for cataract. His examination of cataract patients is completed in all cases by syringing the lachrymal passages, and whenever the slightest narrowing or discharge is detected, he closes the puncta with the electro-cautery the day before the operation. This, together with other proper antiseptic precautions, has enabled him during the past few years to remove a number of cataracts in spite of the presence of dacryo-stenosis, with excellent results. In fact, he declares that this complication, which is generally regarded as a *noli me tangere*, has now lost for him all its dangers. As I have a case of almost mature cataract, where the other eye was lost by suppuration after operation performed by another surgeon, no doubt resulting from still existing dacryocystitis, I intend trying this method, with the consent of the patient. Safety will be enhanced by postponing the extraction a day or two, until complete obstruction of the puncta is surely demonstrated. It would certainly be a benefaction not to be obliged to refuse such persons an operation, thereby condemning them to permanent blindness.

TREATMENT OF KERATOCONUS BY MEANS OF THE GALVANO-CAUTERY AND IRIDECTOMY.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY ROBERT D. GIBSON, M.D.,
OF YOUNGSTOWN, O.

My object in presenting this subject is to get more light.

I have been unable to find any literature upon the subject which gives anything encouraging in the way of treatment.

In October, 1890, while a student under Dr. Knapp in the New York Ophthalmic and Aural Institute, it was my fortune to witness him treat a single case, with small central opacity, by paracentesis with the galvano-cautery needle. I did not see or learn of the results in Dr. Knapp's case, but accepted it as *theoretically* the most likely to give good results, and have tried it in two cases, the results of which I beg to submit for the basis of discussion.

As no definite results are reported, I have nothing with which to compare my results, but trust that they are at least worthy of consideration.

The literature on keratoconus is meager and widely scattered, so that it would be wellnigh impossible to present an acceptable review of the subject, upon which to base our remarks.

As to the cause of the disease we know but little or nothing, except that for a period ranging from a few months to a few years previous to the time vision began to fail, there is a considerable lowering of the vital energies from some cause or other.

As to the exact bearing this would have on the cornea, it cannot be definitely shown, but doubtless the condition present would be analogous to that which in some other person would terminate in ulceration of the cornea (either superficial or interstitial).

The tension is not increased in the least, but on the contrary, it is diminished. In case the tension were increased the curvature of the cornea would be lessened, that is, the eyeball would become a more perfect sphere, and the cornea would no longer maintain the curve of a sphere having a shorter diameter than that of the eyeball. If increasing the tension will produce less curvature of the cornea, surely a subnormal tension must be present to *admit of* increased curvature. And upon examination the tension is found to be subnormal.

The course of the disease is usually slow; the first manifestation being failing distant vision. As the disease progresses there is greater impairment of vision, and in case there is interstitial degeneration the cornea will become hazy, and vision will be reduced to perception of light. The first manifestation of interstitial degeneration may be seen by means of strong oblique illumination (using a large lens). Fine lines may be seen at the apex of the cone, which resemble the lines on crazed glass; these lines increase in number and coalesce till they present the appearance of extensive interstitial ulceration.

This ulceration seems to be confined to the "*substantia propria*" and possibly the anterior "basal membrane," or what is known as the "scleral division" of the cornea, but cases have been reported where the cornea became so thin that they ruptured spontaneously.

The diagnosis in the early stage may be made by means of the ophthalmoscope or Placido's disc. With the ophthalmoscope the optic disc seems kite-shaped, as are also the rings of Placido's disc as seen reflected from the cornea. The parallactic movements may be seen by moving either the head or objective lens. In the advanced stages, the deformity of the cornea is quite noticeable. The full front view of the eye presents a clear, watery appearance, due to the deep anterior chamber and the reflection of light from the surface. The profile view is similar to a cone, therefore the name keratoconus.

During the past six months it has been my privilege to have two cases (three eyes) of keratoconus under my observation.

The first is still clear, though the deformity is quite noticeable and vision is reduced to $\frac{2}{200}$.

The history is: Mrs. U., æt. 22 years, at 15 years of age was thrown out of a carriage on to the road by a runaway team, struck the right side of the face on the ground, both arms were broken, and was otherwise injured so that she was confined to bed for three months. After getting out she noticed the vision of the right eye was failing, and it has resulted in keratoconus.

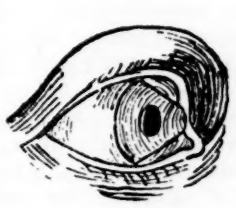

FIG. 1.

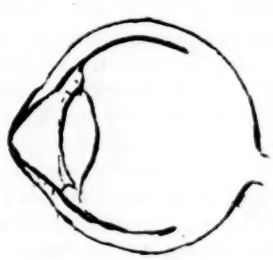

FIG. 2.

The second patient had double keratoconus. The right eye presented a very unfavorable appearance; the cornea protruded to the full extent possible (Figs. 1 and 2), the opacity extended on all sides of the apex so as to completely

[5] Bemerkungen zur Staar Operation, November and December, 1891.

cover the pupil, the central portion of the cornea was extremely thin (Fig. 2), and vision was reduced to perception of light only.

The left eye presented the deformity to the same degree, but was still clear. By strong oblique illumination interstitial degeneration could be determined by the presence of two or three fine lines, at the apex. Vision was 4-200. Her history is as follows:

Miss Sarah S., æt. 22, farmer's daughter, came to my office December 21, 1891. General health not very good; has been ailing since 16 years of age; menstruation irregular, varying from six weeks to sixteen months. Eyes began to fail at about 17 years of age; both failed alike, till a few weeks ago the right "seemed to go all at once."

On account of the failing condition of the left eye, and the fact that the right eye was already useless, it was thought best to operate on the right eye at once (December 21, 1891). Paracentesis of the cornea was performed at the central point with the galvano-cautery needle. The central portion of the cornea was so thin that it wrinkled up or collapsed as the anterior chamber was evacuated. The eye was opened but once each day for inspection. At the end of eight days (December 29) the opening had closed. The cornea had receded about halfway back to the normal curve. The eye was again cocainized and a slightly larger opening made at the same point with the galvano-cautery needle. Kept the eye closely bandaged and patient in bed for eighteen days, inspected the eye once each day, and at the end of eighteen days the opening had entirely closed and the cornea had receded to the normal curve (Fig. 3). The extensive opacity was largely absorbed, but a central opacity nearly the size of

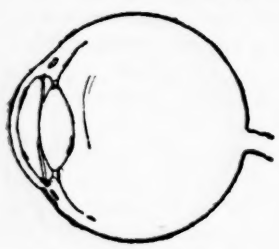

FIG. 3.

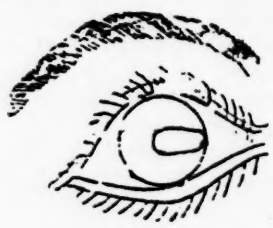

FIG. 4.

the pupil still remained after two months. There was very good vision excepting in a bright light, when the pupil would contract. She could see to read the headlines of the newspapers, and tell the time on my watch to the exact minute. V. equals 20-100. March 18, 1892, an iridectomy was made, inward and slightly downward (Fig. 4), resulting in vision 20-50 +, with + 5 .50 D. cyl. axis 15°. The fact that a *plus* 5 .50 D. glass is accepted would indicate that the cornea must have receded to, if not beyond, its normal position.

The vision of the left eye, in the meantime, was failing on account of the central opacity increasing. It was thought best not to wait till the opacity would become so extensive as in the right eye, therefore the eye was treated after the same manner, and with nearly as good results, as the right eye. V. equals 20-50 —, with — 8.00 D. sph. ⊂ — 3.00 D. cyl. axis 120°. The cornea of the left eye had not become perceptibly thinner than the normal, therefore presented greater resistance to the compress and contraction, and resulted in less correction of the deformity than in the right eye. The result is so good, however, that I hesitate to continue further treatment, but am quite confident that by repeating the puncture once, or possibly twice more, we would be able to get rid of the concave spherical lens.

By making the opening at the central point of the cornea there is no danger of prolapse of the iris.

The advantages of making paracentesis with the galvano-cautery needle are:

1. Perfect antisepsis or asepsis.
2. Prolonged drainage of the anterior chamber.
3. The resulting opacity is reduced to a minimum.
4. There is doubtless some shrinkage of the cicatrix, which would tend to reduce the curvature of the cornea somewhat.

The advisability of performing iridectomy must be governed by the extent of the opacity. I am quite well satisfied that the operation for iridectomy in these two eyes had very little, if any, effect on the curvature of the cornea, and might have been dispensed with, except from the fact that the opacities present before performing paracentesis with the galvano-cautery needle, were large enough to materially interfere with useful vision.

Discussion.

Dr. Henry D. Noyes, New York:—I have been interested in conical cornea for many years and have examined many cases. In the first place the projection of the cornea is often not central. It more frequently is below the horizontal meridian. This is chiefly due to the pressure of the eyelids.

The essential pathology of this condition is that it is not due to intra-ocular tension, but is a process of atrophy of the cornea, and protrusion takes under the normal pressure. This is aggravated by the action of the lids.

Furthermore, these cases, while in a general sense myopic, are susceptible of amelioration in the early stages by glasses of a peculiar character. The glasses best suited are generally convex cylinders. A mixed cylinder with axis at a right angle will often answer well. Examination for astigmatism by the ordinary methods is exceedingly unsatisfactory. There is no use of giving atropia, because in this way you expose a larger surface. The best way is by the stenopaic slit and the method of Thompson who uses two lights and a disk with a little perforation. Then the ophthalmometer comes into play to show the curve of the cornea.

There is still another fact. I labored for a long time over a patient and finally found a glass that gave satisfactory vision. She wore it for a day or two and then rejected it. She finally selected at an opticians a concave cylinder which differed from all examinations and wore that glass with comfort. Hence we must sometimes work by rule of thumb for such patients.

Bowman pointed out the irregular curve of the cornea and many of its phenomena. When the suggestion of using hyperboloid lenses was made by Rachlman, I tried them in a number of instances. Although hypothetically these cases should assume a curve which is some form of a hyperbola, they quickly depart from the hyperbola. The hyperbolic lenses did not answer in my experience, but others have been more fortunate.

In regard to the possibility of the rupture of conical cornea, this is one of the rarest of accidents. Many years ago I saw a conical cornea, three-fourths of an inch long, in a woman from St. Louis.

The surgical treatment is a matter of history from an early period. Graefe was the first to try to cure these surgically. He employed nitrate of silver and paracentesis. The galvano-cautery is classical in the books. It is a well-recognized method of dealing with this affection.

Excision of a piece of the cornea has been resorted to. I did it once. I found that I could excise a flap and put in sutures as in a plastic operation on the skin. The patient recovered with good vision. I do not know that I shall ever do it again. I had a set of Dr. Williams' needles. I left the sutures in three days. I should have removed them in two days, and the fistula that occurred and continued a few days would probably not have formed.

There is an optical phenomena in conical cornea to which I may refer. If you take a cornea with a considerable amount of conicity and illuminate the eye by a convex lens normal to the axis of the eye and station yourself on the temporal side at right angles, you will get a reflex from the back of the cornea coming into your own eye. This is the result of total reflection from its posterior surface.

Dr. H. Knapp, New York:—Dr. Gibson mentioned that he did not see the result of the operation. That case turned out very well. The patient made a long recovery and for six weeks there was constant breaking of the cauterized portion. I was in dread that suppuration would occur. The opening closed permanently leaving a scar somewhat below the centre of the cornea. In the second month after closure the sight was poor, but in the course of six or eight months the cornea flattened so that there was exceedingly satisfactory vision. I operated subsequently on his second eye and to avoid the long healing, thought that I would make the paracentesis of the cornea smaller. I cauterized a small portion and then pierced the center with the ordinary cautery. Only a drop of aqueous escaped. That wound closed soon enough and did not reopen. The operation, which was rather prolonged, was followed by iritis of a peculiar kind and about three weeks later, I saw in the lower part where the heat had acted most intensely, a yellowish substance which was inexplicable to me. It was not pus. The iritis

continued for six weeks or two months, and I feared the occurrence of sympathetic ophthalmia. The mother of the patient, said to me one day "the best of bad things is that what we fear, commonly does not occur." I thought that this was a word of comfort which I might take for my further guidance. This yellow spot developed into a cataract, which I removed later, and the sight, with glasses, was perfect. The curvature of the cornea had become normal. That was three years ago, and the boy is able to use his eyes without trouble. He is a student at Yale College.

The next case I operated on with a galvano-cautery electrode which I had made for the purpose to avoid its prolonged application, for I was afraid that the cataract in the other case might have been caused by the heat. There had been nothing else to cause the cataract. The new electrode, which had an oval end plate, I applied a little below the centre of the cornea, simply turned on the current and cauterized to the depth that I wished. I pierced the place with a pointed tip. The opening closed in five or six weeks. Recovery was good and the result satisfactory.

In the third case I pursued the same method. This was followed by prolapse and iritis. The perforation and the ulceration resulting from it were opposite the lower part of the pupil, and the iris became attached to the cornea. I think that in this case, iridectomy will be advisable.

In two other cases, I operated with the same electrode without piercing the cornea. They have been completely satisfactory, and gave me no anxiety from slow healing or suppuration. The cornea flattened at once, but bulged again when the ulcers had healed. I cauterized again at the same place. Recovery good; corneal curvature normal. Sight excellent, viz.: 20-30 in one, the other not yet finally tested.

All these patients had their far point at one inch. They can read now from nine or twelve inches without glasses.

From my experience I am inclined to consider this as the best method with which I am acquainted—that is, the galvano-cautery without perforation, and if the flattening of the cornea is not sufficient, a repetition of the operation.

Dr. Edward Jackson, Philadelphia:—I think that Dr. Gibson's reasoning in regard to the mechanism of conical cornea is a little defective. If the membranes were uniform in their power of resistance throughout, the influence of tension increased or decreased would be to cause flattening of the cornea. I think, as said by Dr. Noyes, that the central fact in conical cornea is thinning and atrophy of a portion of the cornea, not always in the exact centre, but usually removed a considerable distance from the vascular supply, from the corneal margin. Still, I agree with the author that the tension is usually low, but I do not think the diminished tension is essential to the increase of the curvature.

In reference to the optical correction of conical cornea, the central fact is that the refraction varies from point to point in the cornea. Only in small areas is it uniform. Only a small area will be corrected by any one glass. Of course the glass given must be the one that corrects the portion of the cornea opposite the pupil when it is considerably contracted in near work, or in a bright light. We must select the glass for a small pupil. Dr. Wallace, of Philadelphia, has suggested the use of eserine or pilocarpine; and they can be used with advantage, to find the glass adapted to conical cornea, because they reduce the pupil to the condition in which it will be in near work. I have found more satisfaction from placing the patient in a bright light and making the test at the ordinary distance. In getting at somewhere near the proper glass, retinoscopy is valuable. By it you can make a general survey of the pupil, and select that part which is exposed when the pupil is contracted and has the most uniform refraction, and then choose the glasses to correct that portion, to be confirmed by the subjective test.

Dr. Julian J. Chisolm, Baltimore:—As far back as 1881, I reported my first case of cautery operation for keratoconus. I have performed the operation frequently. In my experience, the larger the needle and the larger the opening made in the cornea, the longer it takes to close, but the more flattening is secured and the better final results obtained.

As to irregularity in the acceptance of glasses for keratoconus, this is a well recognized fact. Sometimes cylinders selected at random give the best results. As strong as 10. + D. + cylinders at an accidentally discovered angle have been selected by a patient as giving the best vision. I have also observed that often the best result was secured through the stenopaic perforation. For some years I have used daily the eserine drop, because the shrunken pupil gave much better vision than the most carefully selected glasses. Half a grain of eserine to the ounce o water, instilled daily into the eyes by the patients themselves, often gives more comfort than glasses.

Dr. G. C. Savage, Nashville:—As to the early diagnosis, I learned eight years ago, while in the Royal Ophthalmic Hospital of London, that with the retinoscope we could detect a beginning keratoconus. I have not seen this referred to in any book. Seated as we usually are in using the retinoscope, and moving the mirror from right to left and up and down, and deflecting the light with or against the movement of the mirror, you will find that if there is slight conicity, the light makes a circular movement. In this way I have often determined its presence and been able to adopt measures for the prevention of further development.

Dr. Robert D. Gibson, Youngstown, O.:—I am glad to have had the opportunity of listening to this liberal discussion. In our literature on this subject no *definite* results are given, and there is nothing with which to compare results. The results are stated as "satisfactory." I should like to know the *exact vision* obtained. To say that we have had "good results," without giving the exact vision, is rather indefinite.

Whether the atrophy of the membranes is a cause or an effect of the deformity, I am unable to state. If it is the *cause*, what are the evidences to support the theory? I merely mentioned it as one of the conditions present.

RESECTION OF THE OPTICO-CILIARY NERVES.

Read in the Section on Ophthalmology at the Forty-third Annual meeting of the American Medical Association, held at Detroit, June, 1892.

BY JULIAN J. CHISOLM, M.D.,
OF BALTIMORE, MARYLAND.

This operation, which is so valuable in many cases, seems to have been abandoned by some ophthalmic surgeons, without sufficient cause. That accidents follow any operation, even the most simple, is an every day occurrence; and in the nature of things must be occasionally looked for. Under careful manipulation, which every surgeon is expected to exercise, failures should become more rare, and therefore should be very seldom met with. Simple nerve section, as a surgical procedure is not always a radical method of relieving pain. Even when a considerable portion of a nerve has been excised, sensation has been in time regained, with a return of the suffering for which the operation had been undertaken. To this experience the ciliary nerves are not exempt; and yet they possess so many peculiar advantages for a successful section. Their location, so easy of access; their isolated surroundings; the small extent of incision required; the small amount of blood lost; the loose connective tissue in which the nerves are imbedded, permitting a considerable separation of the divided nerve ends by the accumulating blood pushing forward the eye-ball and forcing backward the socket tissues; then the displacing of the delicate ciliary nerve threads when pressure is made on the protruding eye-ball by a firmly tied bandage, are all most valuable considerations for securing a favorable result.

In nerve section, as usually undertaken, the nerve is either imbedded in a dense fibrous tissue, so that the separation of the cut ends must be very limited unless they are dissected away from each other; or the affected nerve traverses a bone, and therefore is difficult of access; or it accompanies a large vessel and is necessarily dangerous to divide unless isolated by a careful and often tedious dissection. The nerve attachments of the eye seem especially arranged for easy section. They are clustered together in a very isolated manner. For a long distance they traverse the central axis of an ample cone which is only filled

by an unimportant cellular tissue. In the midst of this they can be easily, speedily and surely reached, without detriment to any important structures, if ordinary care is taken by the operator. The contiguous vessels are all small, consequently no serious hæmorrhage is to be feared. The very looseness of the fatty tissues upon which the eye rests facilitates the wide separation of the nerve ends, when the escape of blood from the divided vessels accumulates in the socket. This blood pressure so disarranges the free ends of these conducting threads that their readjustment is very improbable; and yet we know that this reunion does sometimes take place. This is the only accident that should follow this simple, safe, and useful operation.

I do not propose in this paper to give a detailed history of optico-ciliary neurotomy; nor the various methods adopted by surgeons to divide or resect these nerves. With such you are all familiar. My object is to give my own personal experience with this operation from the year 1879 when I first performed it. From that time I have used it annually, as proper cases offered, until my experience now covers eighty-one operations; a sufficiently large number to draw safe conclusions from. In my early practice I tried the various methods of muscle section to facilitate the exposure of the nerve. I soon found that they complicated needlessly the operative manual, and made a very tedious and serious operation of what should be a very speedy and simple one. When the muscles were tenotomized, and afterward sutured, the tension put upon the threads by the blood clot accumulating behind the eye-ball would often tear out the sutures, or so stretch them as to produce an ugly strabismus; an after result that is not satisfactory.

As I was performing this nerve section only for the relief of pain, I did not see the need of taking away a piece of the optic nerve; nor could I see what special advantage would ensue should I bring this nerve under observation while I was dividing it. Therefore at a very early date I abandoned all needless manipulation, and adopted the simplest way of finding the nerve, with the least disturbance of the eye attachments.

I found that the nerve could be easily reached through a conjunctival incision made at the inner or outer canthus, below or above, and parallel with the inner or outer rectus muscle. This method I have exclusively adopted for many years. It makes the the operation so easy to both surgeon and patient that it might be utilized in every case of a comparatively goodlooking, lost and painful eye, which would otherwise be condemned to enucleation. It was never intended by a neurotomy to replace, in all cases, the removal of injured eyes. The majority of lost and painful eyes are so disfigured by the accident, or by subsequent inflammation, that they are not worth preserving. There are still left in the list of lost eyes quite a number, so little deformed, that no one would willingly give them up, were they not the cause of constant suffering. It is for this class of eyes that the operation of neurotomy is so especially applicable.

My method of procedure is as follows: A general anæsthetic is always administered. I have used cocaine for socket operations, but it has never given, to either myself or the patient, the satisfaction expected. For neurotomies, which are quick operations, I use the bromide of ethyl, because of its prompt and evanescent action. After a very few full inspirations of the ethylized ether, during a period that does not exceed one minute of time, the patient is completely anæsthetized. The eye is then thoroughly washed by a chloride lotion. A speculum keeps the lids apart. A fold of conjunctiva is caught up by the forceps, and is cut across in such a way as to make a horizontal incision, which extends from the lower and inner border of the cornea to near the caruncula. It lies parallel with the lower border of the inner rectus muscle, and is but little more extended than the conjunctival incision for squint operations. The application of the points of the scissors in this orifice opens the capsule below the rectus muscle. An instrument terminating in two small hooks is passed into the depth of the wound, and planted well back in the sclerotic. By drawing upon this instrument the eyeball is rotated forcibly outward, which brings the optic nerve with its important ciliary nerve surroundings, within easy reach. The curved enucleation scissors is now introduced through the wound into the socket directly behind the eyeball. With its closed blades, playing the part of a probe, the resistant optic nerve cord is sought. When it is found, by drawing the scissors forward until the nerve escapes, then opening the blades widely, the optic nerve with its entire surroundings can be caught in the jaws of the instrument. The resistance made during the section is proof the nerve has been seized; and if the scissors have been properly manipulated it ensures the complete division of the entire bunch of nerve cords. As an evidence that this has been accomplished the closed scissors, used as a probe, can now move freely in all directions behind the eyeball without meeting any impediment. To secure this complete severance of the nerve bundle needs some familiarity with the resistance which the optic nerve makes to the section. The scissors must not be allowed to slide backward during the section, but the jaws of the instrument must be held firmly against the resisting body. The operation is now completed and the scissors are withdrawn.

In the minute necessary to perform the entire manipulation, blood has been pouring out of the divided ciliary vessels. It has been pushing the eyeball forward, and it has also been escaping from the wound. If this hæmorrhage be not at once stopped the eye would become exceedingly prominent, in forced exophthalmos, with quite enough tension to cloud the cornea and threaten its future safety. Without loss of time the speculum is withdrawn, and a large compress is firmly secured over the eye by a bandage. In one or two minutes consciousness returns, and the patient goes to his bed. As the after pains of the pressure bandage are annoying, a hypodermic of morphia is administered before the patient leaves the operating table. Pressure over the eye is kept up for several hours, or until all hæmorrhage from the divided vessels has ceased. This heavy compress is exchanged the next day for a simple dry dressing. Blood always infiltrates the conjunctiva and the lids, so that the surroundings of the eye are very much blackened from extravasation. It requires at least two or three weeks before this discoloration is altogether removed. The pains in the eye disappear promptly with the nerve section; and in my experience, permanent relief is usually secured.

The patient has had preserved to him a good-look-

ing eye, that is worth all the risks of having the pain return to it at some future time, when the more radical operation of enucleation, if demanded, can be performed. Should this second operation not be required, he has been saved the constantly present thought of the mutilation which he has been subjected to, and which embitters his entire future life. He also escapes the daily annoyance of using an artificial eye, which gives a lot of trouble, as every wearer of one only too well knows.

Too many dangerously painful, but still good-looking, eyes have been ruthlessly enucleated, when this much to be preferred operation might have been substituted. I am fully aware of the many accidents which have occurred in the practice of ophthalmic surgeons—how hæmorrhage has been excessive; how dangerous and even fatal cellulitis has followed the exposure of the orbital tissues; how the cornea has sloughed; how the eyeball has in time become atrophic; and how endless troubles are engendered as the sequel of this operation. I will only say that in my experience no such accident has ever happened. I may have avoided many of them by using sterilized instruments; also by discarding at an early period the more serious exposure of the socket tissues by not doing myotomies, nor being desirous of bringing the optic nerve into view, so as to make the section, as it were, under the eye. I always felt that this bold, I am rather disposed to call it rash, dissection invited the serious accidents which afterward followed.

Unfortunately, I am not able to trace all of my cases. Several of them I have seen years after the nerve section. They had enjoyed life undisturbed by any return of pain. Others had promised to report promptly any returning discomfort. From these I have not heard, and therefore I presume that they have had no recurrence. In only four cases, coming to my knowledge, has it been necessary to resort at a later day to enucleation. There may be other cases in which this secondary operation may have been required. Had it been in many, I would certainly have heard of some of them.

In suitable cases of good-looking, lost, and painful eyes, I feel assured that neurotomy is far preferable to the mutilation of enucleation. I think that this statement will be accepted by all without a dissenting voice, if the dangers which some have encountered can be avoided. This can be in a measure secured by adopting the simpler operation, which in my experience is equally effective, when it is properly performed, as the more complicated ones, and with much less risk. It is also an operation which even the most timid patient will accept, when they would refuse to have an eyeball removed.

Notwithstanding the dangers ascribed to neurotomy, many of which are avoidable, I think that it would be well if surgeons who have discarded this good operation would again replace it on their list of available methods. Knowing its defects, and also being familiar with its advantages, were I required to make a choice between these two operations, enucleation or neurotomy, for a member of my own household, I would not hesitate an instant in the selection. I would accept the neurotomy.

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Discussion.

Dr. Eugene Smith, Detroit:—I regret that my experience does not correspond with that of Dr. Chisolm. I began the use of this operation in 1887-8, but soon stopped it. I had a pair of curved scissors made to fit around the posterior portion of the eye ball. I first began after the method of cutting the external muscle, and found the operation complicated. I then simplified the operation by making the incision beneath the external rectus muscle, and carrying the scissors behind the eye ball. The scissors hug the posterior surface of the eyeball very closely, and cause little mutilation. In no instance have I had an unfortunate result except the subsequent atrophy of the eye. There is a lady in this city on whom I operated at that time who wears an artificial eye. In almost every instance the eyeball has softened and generally atrophied to such an extent as to cause the patient to prefer an artificial eye, but it does make an elegant stump for an artificial eye. Since then I have abandoned the operation.

Dr. Samuel Risley, Philadelphia:—In what proportion of this large group of cases was the operation done for sympathetic ophthalmia? Were all the operations done for the relief of pain? This seems to me to be a very large number of eyes to be still painful, and yet present other conditions justifying optico-ciliary neurotomy. One of the most interesting and important causes for which it could be performed would be to save the eyeball in sympathetic irritation.

Dr. F. C. Hotz, Chicago:—I have never performed optico-ciliary neurotomy, and was therefore anxious to hear the paper in order to perhaps learn enough to induce me to perform it. I must confess that I am rather disappointed in my expectation, for if I understand the reader, his main indication for performing optico-ciliary neurotomy in place of enucleation is the painful condition of a good looking eye, where the eye is in such a condition as to make it worth preserving on cosmetic grounds. In the painful eyes that I have seen there has always been so much internal trouble that though the eye may have presented a pretty good appearance at the time, there was reason to expect that there would be a change in the appearance for the worse and therefore I have considered it better to enucleate at once.

Dr. S. C. Ayres, Cincinnati:—I would ask Dr. Chisolm whether the eyes on which he operates are blind from injury or inflammation? Does he enucleate the eyes that may become blind from any cause?

Dr. Julian J. Chisolm, Baltimore:—These neurotomies were designed for the protection of the patient, both from immediate suffering and the dangers of sympathetic trouble. The cases belong to both classes, those in which the sight has been lost from disease or by accident. We know that there are many wounds of the ciliary region afterwards accompanied by inflammatory trouble in which there is great danger. We find the patient suffering with pain, and we are not sure that sympathetic trouble may not follow. These eyes are often good looking. We know that if the patients could preserve their lost eyes without suffering, they would not seek any surgical interferrence. These eyes are often painful. I do know that in many of these instances where I have divided the nerve, a still good-looking, painless, anæsthetised eye is retained where otherwise it would be condemned to enucleation.

The operation is applicable to large numbers of eyes. Take that large class of absolute glaucoma. No one would be willing to give up a glaucomatous eye if they could painlessly keep it. These eyes are often very painful, the pupil enlarged and the lens cloudy. Should the pressure of the eye cause suffering, these should be cases for neurotomy in preference to enucleation.

Take another large class where the eye has been destroyed by choroido-iritis. We find still a comparatively good-looking eye which if it can be kept, is infinitely better than an artificial eye. If we can save to the individual such an eye by neurotomy, I contend that this is infinitely better than enucleation.

So far as atrophy is concerned, it has been my good fortune not to meet one such case, and I have seen many of these patients years after the operation. I have not been able to trace all of my neurotomies, so that I can not say that this result has not occurred. I am sure that those whom I have seen months or years after operation, with cornea still anæsthetic, a good looking eye with all its motions and discomfort, will not hesitate to say that neurotomy is a vast improvement on enucleation.

Acid Nitrate of Bismuth in Glycerine is a specific in microbic skin diseases.—*Curtman.*

MONOCULAR DIPLOPIA.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY ROBERT TILLEY, M.D.,
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In January 1888, I published a case of monocular diplopia. In order to avoid misapprehension, it may be well to state that the phase monocular diplopia is used to express the phenomenon, when there exists no visible anatomical peculiarity of the eyeball by which double images could be produced on the retina. Before narrating my own observation, I referred to similar cases published in the transactions of the Ophthalmological Society of the United Kingdom, giving particular attention to such cases as had been followed by an autopsy. At the last meeting of this society, Dr. J. H. Thompson, of Kansas City, brought the question before this Section, reported an interesting case and discovered the probable causes of the phenomenon. He referred to several other cases. Among others, one by Foutan reported to the Ophthalmological Congress, 1885, and accompanied by a very ingenious possible explanation of the phenomenon; and the case of Charlie Green, of St. Louis, reported separately by Dr. A. B. Shaw and Dr. Bremer, of St. Louis. This last case was especially interesting, inasmuch as it was followed by an autopsy but, very unfortunately, as far as I can understand was not well investigated from an ophthalmological standpoint:

When I reported my case in 1888, I supposed I should never see it again, but fortunately such was not the case. I will as briefly as possible recapitulate the history as then published and supplement its completion. A few years ago it was necessary to particularize accurately the details so as to show that there was no confusion between the phenomenon in question and an anatomically developed diplopia. Such minuteness is now scarcely necessary.

Mary R., 9 years, orphan, no family history obtainable; face expresses great distress, suppliant expression; step cautious as though afraid of jarring the head; eye (left) partially closed; movements of eye painful, no paralysis. severe pains in the head; slight conjunctivitis; cornea, aqueous; iris, lens, vitreous and fundus all normal; V. 6-18 with both eyes and each eye separately. N. V., S. O. 6; pupils contract normally both under the influence of light and accommodation. Persistently claims double vision in the left eye and denies it in the right. However the experiment was varied she never failed to sustain her claims and never contradicted herself. Under atropine the same answers were given to similar questions. Only now she claimed that for near vision one of the images was a good deal nearer to her than the other. For distant images this peculiarity did not appear or at any rate it was not demonstrated. She had no conception of any difference in color, between greens and greys; but a specimen of her work which I exhibit to you will give a better conception of her confusion of colors than any number of words (worsted work exhibited). This color blindness was in all probability of recent origin. These observations were made between November 12, 1887, and December 4, 1887.

December 4. She suffered from convulsions which came on in church and lasted for four hours. On the 8th, Dr. W. Brown, Professor of Nervous and Mental Diseases of Women's Medical College, was called in consultation. She had suffered from frequent delirium, excessive vomiting, buried her head in the pillow apparently from pain. She was, however, quiet enough at this time to demonstrate the diplopic phenomenon.

December 15. She improved rapidly without any manifest explanation, vomiting ceased, slept well, ate well. There was no mydriasis, no lack of accommodation, no paralysis. She still sees double with the left eye alone, the extra image is always in the nasal and upper half of field.

December 19. She left the institution in charge of the sisters and they reported that she seemed as well as ever but less active and less capable mentally.

January 19. As she did not return to the institution I visited her at her aunt's house. I found she was afflicted with abscesses in different parts of the body. The double images were still manifest to her left eye. My first report ended here. I did not expect to see her again but she returned to the sisters' charge and I had an opportunity of proving to myself that the diplopia had entirely disappeared and so had the color blindness. She sorted out the worsted skeins with a facility which left nothing to be desired. She remained with the sisters about twelve months and during that time although I was in constant attendance I never had occasions to see her except for my own gratification. About six months after her departure from the school the sisters reported to me that she was dead. There was no autopsy and I could get no reliable account of her last illness. The case presents these features of interest: Monocular diplopia confined to one eye, associated with severe cerebral disturbance and color blindness and recovery from both symptoms prior to death.

Since the observation of this case I have seen four others. All of them as clear and well defined relative to the diplopia as the one narrated:

Case 1.—Ilya H., 9 years, Swedish girl. There was a well defined monocular diplopia in both eyes, diminished visual acuity—6-18, deficiency of color sense. There was no manifest difficulty in the media or iridis and the fundus had a normal appearance. A month later she said her eyes annoyed her less and her vision was 6-9 nearly. Her mother did not bring her again. When I saw her later she reported that the child was quite well, did not complain of her eyes, but although she promised to let me see her she failed to do so.

Case 2.—F. M., 8 years, robust, strong, healthy looking girl was brought to my office by her father, a well to do and intelligent man. The child herself, without any solicition, complained that she saw double with each eye. The eyes presented a normal appearance in every respect and her vision was 6-6. I could find no evidence whatever, of cerebral trouble and I could give no satisfactory explanation of the phenomenon. Several of her teeth however, were badly decayed and I recommended their removal as a possible solution of the difficulty. I took no note of the color sense. A few days after the second visit, the last time I saw her, I received the following letter from the father: "March 3, 1890. Robert Tilley, M.D. Dear Sir: I am happy to say to you that my daughter's eyes seem to be now thoroughly well. The next day after I saw you, Mrs. M. took the child to the dentist and had the four bad teeth extracted. Since then she has had no trouble with her eyes. She used the prescription for a few days and seems to have entirely recovered." I did not quite believe this but supposed it was a polite way of saying that he had decided to change his oculist. As a preparation for this paper I went to the father's former office and learnt from his nephew that the child was the picture of health, and did not complain in any way about her eyes. That the father, after having for a year and a half, suffered from paralysis of the right side associated with, at the commencement, some difficulty in speech, died about the end of February of this year. I mention this fact as of some possible value in explanation of the cause of the phenomenon. He was about forty years old and paralysis of the right side with disturbance of speech in a man of that age has a probable significance.

(NOTE.—I have learned whilst here at Detroit, that the father contracted syphilis some fifteen years before I saw the child.)

Case 3.—Carrie H., a bright little girl of 8 years, complains of great discomfort in her eyes, disturbed with artificial light and of seeing two things with one eye. External appearance of the eyes normal, no sign of squint, or paralysis, or paresis, movement of eye good in every respect, V. 6-9, color vision normal, retinal vessels rather tortuous and fundus slightly mottled.

February 10, 1891. Says that yesterday while in school her vision left her for a while, says "it was the same as though her eyes were shut only it was light." When I saw her on the 19th, February, she claimed that the double vision had completely disappeared and her mother claimed that she was decidedly better in health. In a later report the mother informed me that the child did not complain any more of her eyes. This child is one of a family of two, her sister died of convulsions about a week after birth and she herself was cyanotic for

some period after birth and is now afflicted with a general enlargement of the heart.

Case 4 was one of considerable interest, but one that I could not investigate to my satisfaction on account of peculiar circumstances. Hilda R., about 12 years, was the plaintiff for damages on account of alleged injuries in a railroad accident. She was completely hæmianæsthesic—left side—actual cautery pricking of pins elicited no response on the left side, bottle of officinal ammonia held to the left nostril provoked no expression of sensation, hearing appeared to be deficient, and sight a good deal below normal. The vision of both eyes was apparently deficient, and a deficiency of color sense. But what had not been observed was a well defined monocular diplopia in each eye. There was present during the examination the chief surgeon of the road as well as the family physician. I demonstrated the evidence of the monocular diplopia to surgeon, by a simple device. I put into the stereoscope, the card which I show you, the girl was of German parentage, and requested her to read everything she saw in the order in which it appeared. She read off every word twice. The fundus revealed a small amount of choroiditis, and the cervical glands were enlarged.

The nature of the accident was as follows: She was riding in a wagon, crossing a track, when a locomotive struck the wagon and projected the child a considerable distance. The left clavicle was broken and several small insignificant scalp wounds were made, but none of them in the posterior part of the head.

I reported that it was very improbable that the injuries were associated with the eye or ear symptoms, and in consequence of the choroiditis and enlarged cervical glands suggested to the lawyer to inquire into the family history of the child. The examination on the stand showed that the child's parents had had nine children, and only two were alive, the others having died in infancy; that the father's father had had eleven children, nine of whom died in infancy.

I have nothing more to add about this case. She was not my patient,I was only acting as an examiner and expert for the railroad. I have brought forward these items thinking they may contribute something to the elucidation of an obscure phenomenon. You will please observe that no claim was made on the part of the plaintiff of double vision, it did not seem to have occurred to any one interested in the prosecution, consequently that peculiar feature did not appear in the evidence. I should add, that during the trial she had an hysterical attack—screamed violently, and displayed well-marked athetosis of the fingers.

I will now try and show what of the various symptoms exhibited are common to all the cases. But before doing this I will remark that all cases that furnish a good ground for auto-suggestion should be thrown out as not belonging to the subject in hand; but on the other hand, auto-suggestion should not be entertained without a well defined reason. In our endeavors to avoid being deceived, especially relative to a statement for which we cannot assign a well formed theory, we are also in danger of deceiving ourselves. I will also call attention to what seems to be a mistake in the contribution of Dr. Thompson made to this Section last year. In referring to the case reported by Dr. Ord, said to be reported in St. Thomas Hospital Reports, 1879, it is stated relative to a boy of 13 years, "could find nothing abnormal in the eye or brain." I have not been able to consult St.Thomas Hospital Reports for that year, but Dr. Ord had a boy 13 years of age under his care in St. Thomas Hospital in 1879, and he is stated to have had an epileptic fit, but he himself states[1] that in dismissing the case he wrote as the nearest approach to a diagnosis cerebral tumor. Moreover, this same boy thirteen months later, Nov. 16, 1880, entered the "Leopold ward under Mr. McCormac, suffering from an abscess in the neck which was supposed to be connected with disease of some of the upper cervical vertebræ. He was then suffering from heart disease, and he died quite suddenly on the 20th of November, having giving no signs of cerebral affection, so that his death was supposed to be caused by sudden compression of the cord through giving way of the odontoid process." The result of the autopsy I gave in my communication of 1888. It was a large egg shaped blood clot 2½ inches long and one inch thick in the right hemisphere, encroaching on the lateral ventricle. I did not, however, add what is stated, that the hemisphere and the clot is preserved in the museum of St. Thomas' Hospital. I would like to call especial attention to the fact that notwithstanding this very gross lesion in the right hemisphere,the boy entered the surgical ward and no note was taken of any cerebral symptoms. So that it is not fair to suppose because gross cerebral symptoms are not observed, therefore, there are no lesions.

The chief symptoms,common to the three cases followed by an autopsy were convulsions,severe vomiting, great pain and double vision of one or both eyes. In some of those cases not terminating fatally there was present paresis or paralysis of some of the exterior muscles as well as the symptoms above indicated, in some milder cases there was practically little complained of except the diplopia together with some asthenopia.

In the three autopsies the chief lesion was found in the right cerebral hemisphere,whether the difficulty was chiefly referred to the right or the left eye. All of these lesions involved the posterior part of the hemisphere and one of them involved the cerebellum.

Whilst I do not think that it is proven that inherited syphilis has been an important factor in the most of these cases I regard it as very probable. You will remember that the case reported by Dr. Ord, although it left the hospital relieved of the severe symptoms which referred to the eye, reëntered with abscess in the neck associated with necrosed bone. In the case that I reported, abscesses appeared in various parts of the child's body. One child's father died a little while after I saw her from the effects of syphilis. The child that I examined for the railroad had choroiditis and enlarged cervical glands. Another child which I examined, Carrie H., a few days ago, although the diplopia had disappeared, had a well defined chain of enlarged cervical glands.

To explain the phenomenon I think the suggestion of Professor Foutan as practically satisfactory for the present,namely: That the impressions received by each eye are transmitted respectively to the right and left hemispheres and that in the normal condition these impressions are fused by communicating nerve fibres. When these communicating nerve fibres, however, are disturbed,double monocular vision should occur.

[1] Transactions Oph. Soc. United Kingdom, 1882.

Asiatic Cholera.—Dr. R. W. Mitchell has had success with the following (Memphis *Med. Mo.*):

℞. Acidi sulphurici dil, ℥ss.
Morph. sulphat, gr. ⅓.
Spts. vini gallici, ℥jss.
Aquæ destillatæ, ℥iij.

℔.—Sig. Inject under the skin of the arms, legs, and over the stomach every hour until symptoms of the disease are relieved.—*Medical Review.*

DOMESTIC CORRESPONDENCE.

History of Asiatic Cholera in New Orleans, La.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

The rapid progress of Asiatic cholera in Europe at this time, has justly alarmed the sanitary authorities of this great republic; but health authorities should not lose sight of the important fact that the *ordinary bowel affections at all times present with us inflict in the long run far greater mortality than Asiatic cholera.*

This proposition will be illustrated by the following

BRIEF HISTORY OF ASIATIC CHOLERA IN NEW ORLEANS.

It would be foreign to our purpose to enter fully into the history of this foreign pestilence which has at various times reached the shores of Louisiana from the shores of Europe across the waters of the Atlantic ocean and the Gulf of Mexico.

Asiatic cholera has played no insignificant part in the grand carnival of disease and death.

In 1832, Asiatic cholera in conjunction with yellow fever, swelled the mortality of New Orleans to 8,099 deaths, in a population of 55,084; and marked this year as the most terrible in the annals of this city, the death rate reaching the enormous proportion of 147.10 per 1,000 inhabitants.

In 1832, the inhabitants of New Orleans were more than decimated; more than one-seventh of their number were destroyed chiefly by Asiatic cholera, and yellow fever, as being in addition to the usual endemic and epidemic diseases.

The Charity Hospital affords the following statistics of Asiatic cholera:

1848,	cases, 662;	deaths, 396;		1849,	cases, 1,813;	deaths, 1,122;	
1850,	" 724;	" 530;		1851,	" 382;	" 292;	
1852,	" 485;	" 358;		1853,	" 194;	" 115;	
1854,	" 478;	" 352;		1855,	" 351;	" 225;	
1856,	" 32;	" 11;		1857,	" 1;	" 1;	

Total, 1842–1860, (18 years).
Cases, 5,122; deaths, 3,402.
Percentage of deaths, 66.14.

During the 16 years following the civil war, New Orleans was comparatively exempt from Asiatic cholera, as shown by the statistics of the Charity Hospital Transactions:

1866,	cases, 300;	deaths, 237;		1867,	cases, 166;	deaths, 70;	
1868,	" 15	" 9		1873,	" 34	" 27	

Total cases and deaths, 16 years in the Charity Hospital (1864–1880) cases, 443; deaths, 343; per cent. of deaths, 77.4.

There were received into the Charity Hospital during 34 years (1846–1880) 5,565 cases of Asiatic cholera of which 3,745 terminated fatally, giving a rate of mortality of 67.3 per cent.

The first authentic records which we have of the appearance of Asiatic cholera in New Orleans, relate to the year 1832, when it occasioned 4,346 deaths out of a total of 8,099 deaths from all causes, yellow fever claiming only 400 deaths in this the most pestilential year in the annals of this city.

The disease claimed 1,000 victims out of a total of 34,976 deaths in 1833. In 1832, 78.78 per 1,000 of the inhabitants were destroyed by Asiatic cholera.

Cholera appeared again in 1848, and destroyed 1,646 inhabitants, and continued its ravages for some years, the deaths being:

Year.	No. Deaths.	Year.	No. Deaths.
1849	3,176	1858	28
1850	1,148	1859	27
1851	430	1860	30
1852	1,329	1861	17
1853	585	1863	4
1855	883	1864	5
1856	46	1865	9
1857	24		

Total deaths from Asiatic cholera in New Orleans, during a period of 19 years (1844–1865) 9,678.

Cholera appeared again in 1866, and continued its ravages for three years. The deaths were as follows:

Year.	No. Deaths.	Year.	No. Deaths.
1866	1,294	1871	6
1867	581	1873	142
1868	129	1874	6
1869	4	1875	4
1870	3		

Total deaths during 15 years (1866–1880) 2,169.

It is evident from the preceding statistics, that during a period of 34 years (1846–1880) Asiatic cholera destroyed 11,847 of the citizens of New Orleans, and if we add to this the number of deaths occasioned by the disease in 1832 and 1833, we have a grand total of 17,187 deaths.

It is probable that the mortality occasioned by Asiatic cholera was far more in excess of these figures, for we find upon careful examination of the mortuary records of New Orleans, that during a period of 34 years (that is 1846 to 1880) the deaths from bowel affections were as follows:

Cholera morbus	889
Cholera infantum	2,408
Teething	3,430
Gastritis	743
Enteritis	6,916
Dysentery	7,097
Diarrhœa	8,289
Total	29,772

During the same period of 34 years, yellow fever occasioned 28,739 deaths.

It is evident, therefore, that the so-called ordinary bowel affections, diarrhœa, dysentery, cholera morbus, enteritis, gastritis, and teething (cholera infantum), actually caused a larger number of deaths in New Orleans than yellow fever. And if we add the 11,847 deaths caused by Asiatic cholera, we have a grand total of 41,618 deaths from these diseases in which derangements of the gastric intestinal mucous membrane forms the most prominent symptoms. The continuous and fearful mortality of this class of diseases must be diminished by improved and domestic sanitation.

The great essentials of sanitary reform for the diminution of the ravages and fatality of the cases of bowel affections in New Orleans must be based upon:

1. Thorough drainage of the entire parish of Orleans, and especially that portion occupied by the city of New Orleans.
2. The prompt removal of all fecal matter out of the limits of the city.
3. The daily removal of garbage.
4. Systematic and thorough cleansing and disinfection of private premises, public buildings, factories, markets, streets and gutters.
5. The filling up with sand and gravel of all low lots.
6. Free supply of pure filtered river water to all classes at the lowest possible cost.
7. The honest and efficient inspection of markets, milk, meat, fish, fruit and food supplies.

Respectfully,

JOSEPH JONES, M.D., LL.D.

156 Washington ave., New Orleans, La., August 30, 1892.

SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.—By order of the Council, the annual meeting of the Association has been postponed from the 8th, 9th and 10th, until the 15th, 16th and 17th of November. It was thought wise to change the time of meeting from the fact that the 8th of November is the date of the Presidential election.

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MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, SEPTEMBER 10, 1892.

THE CHOLERA PSYCHOLOGICALLY.

The arrival of cholera opens up a new phase of preventive medicine that so far has not attracted much attention. The old proverb that fear kills more persons than disease, is likely to be fearfully illustrated in this country. Already the press has begun with the most minute and exhaustive descriptions of this disease, and its varied symptoms. The natural dread and panic which exists following every sudden mysterious epidemic is intensified to an alarming degree. Each reader is unfitted both physically and psychically to resist the germ poisons. The vital centers are depressed and he is placed in the most favorable condition to be attacked, and to succumb at once. The cleaning up of streets and sewers, and placing the towns and cities in the best hygienic conditions is only a part of the real preventive remedies. The army of neurotics, and the nerve and brain exhausted men and women of every town and city, need protection from this mental source of danger. The more minutely and graphically cholera is described, the greater the number of victims from these classes. A psychical contagion will break up the conservative power of the nerve centers, and precipitate profound depressions that will take on all the characteristic symptoms, even to death. Every where the profession should protest against this indiscriminate publication of details of this epidemic. People should be advised not to read long accounts of the progress of this disease. Boards of health, and sanitary authorities, should point out the danger from this source, and urge the press to conform to the teachings of science, and aid in the efforts to limit this scourge. If medical men would keep a record of panic struck mental cases, which are sure to occur in every town, very interesting data would be gathered. While these facts are not new, and are more or less familiar to every medical man, they are overlooked in the excitement of the time and occasion. They are of much greater interest in this country than elsewhere, because of the freedom of the press, the greater skill and facilities of writing up these events, and the larger number of daily readers who depend on the papers for their usual excitement. If the New York, or other large dailies, should describe these cholera cases, as dying with wild shaking delirium, a large proportion would have these identical symptoms. This takes place in other cases and has been pointed out many times before.

To avoid a panic in times of excitement is practically to suppress all details in the daily press, especially in matters of disease. The profession ought to join everywhere in teaching the press the danger of publishing details of epidemics. Already two cases are reported of deaths with all the symptoms of chlorina where the victims read minutely all the press accounts of cholera. While cholera may not be very serious or wide spread in this country, it is evident that its control is largely in the hands of the profession, and that prevention is the highest achievement of science. The public will of course demand the latest news of its progress, but only the morbid neurotics will call for the details, and the symptoms of its appearance; but the press owes a duty to the public to suppress these, as a sanitary measure While it is not likely this will be done at present, we urge our readers to observe and gather up all records of cases, that can be traced to this source. Preventive medicine will demand in the near future the removal or correction, of all psychical as well as physical causes. Science will teach that epidemics have other than germ poisons to perpetuate and extend their destructive power.

The press advice to keep cool and avoid panic, must be coupled with the most general facts of the progress of the evil. Otherwise they furnish the very material and germ forces for the most aggravated panic, because it is applied to each one personally, and vast numbers of persons can not avoid the inevitable contagion of applying to themselves, the conditions described. The cholera will be fatal in many cases, but mental contagion growing out of the unstrained publication of all symptoms, will have far more victims.

The germ soil is here, and all the conditions are favorable, let the reporter write up in the usual sensational way the coming disease, and it may be here at once in all its virulence.

THE MEDICAL ASPECTS OF CRIME PREVENTION.

A governmental report on the Fourth International Prison Congress held at St. Petersburg has appeared under the editorship of HON. C. D. RANDALL of Michigan. We desire to commend the document to all medical men who indulge a taste for the study of correctional reform. An address contained in this

volume, by SENATOR CANONICO, of Rome, may be quoted briefly since it places a most remarkable value on the influence that may be exerted by physicians for the reformation of vicious persons. He says: "The physician is, above all, the director of the prison, and he ought to be. Entering with a loving and devoted spirit the place of each convict, seeking to possess his confidence, laboring with each according to his disposition; better than any one else he can contribute to the awakening of the conscience. The pivot of prison reform is a good personal direction. But the most essential and difficult matter will be to make the diseased person—that is to say, the prisoner—consent to take the remedy. If he will not take it when properly prescribed the fault will not be in the remedy, nor in the physician, but in the patient himself. We build prisons, but what is more difficult is to introduce into them the spirit of penitence." It is without doubt true that of all the persons who come into contact with prisoners the physician is the one who can with the least difficulty win their attention, but to how many of our jail physicians has the thought occurred that they have before them the same line of possible benefactions that gave to JOHN HOWARD an undying name?

HEAD TETANUS OF ROSE.

The infrequency with which certain diseases are observed in the human subject is occasionally a consideration worthy of discussion. At first it would appear as though there must necessarily be some peculiarity in the individual or upon the part of the etiological factor not present in other cases. Those diseases which are clearly of bacterial origin are of greatest interest in this particular direction. A biological study of bacteria, including their manner of propagation, their range of conditions for development, and their parasitic propensities may possibly give a key to the situation. Such facultative parasites as the tetanus bacillus or that of malignant œdema may never produce disease until accidentally transferred to some host where they are capable of growing and producing characteristic changes. These examples of accidental infection are often of so rare occurrence that an instance is not seen among thousands of cases of disease. Their rarity and the interesting facts that may be adduced from them, require that each instance should have a complete history and an exhaustive clinical examination. What geologist would allow a rare form of fossil bivalve to go unpublished, or would an embryologist permit an unusual case of fission to be forgotten? Such neglect could never occur to the true scientist. Yet it is true that in general practice, the value to be derived from such cases is lost owing to inadvertence or failure in a timely consideration. The neglect to publish or to notice previous cases, is also a fault of frequent occurrence. As an example, NICHOLAIR (*Virch. Arch.*, Band 128, Heft I, 1892) deplores the fact that a case of so-called ROSE'S head tetanus which was observed and investigated by him remained without notice by contemporaries. As only some forty-two or three cases in all have thus far been recognized, it may be appropriate to recall the subject at this point.

In 1870 ROSE reported a peculiar clinical form of tetanus that occurred after injuries to the face and neck. It was characterized by facial paralysis upon the side of the injury and subsequent tonic contractures of the musculature of the neck and larynx. BRUNNER inoculated guinea-pigs with the tetanus cultures upon one side of the head and observed contractures throughout the distribution of the facial nerve, and later trismus and general contractures. It would appear, because of the failure to produce facial paralysis experimentally in animals, that there were other factors, beyond the tetanus infection present in man. In France several cases of head tetanus were examined bacteriologically, and although many microörganisms were demonstrated, yet the tetanus bacillus was not isolated. ROUX and SPANJE reported their investigations negatively. The reason probably being in a failure of their methods. FLUGGE and REMBOLD produced tetanus by introducing a splinter from a case of head tetanus into mice, but did not demonstrate tetanus bacilli. The case of NICHOLAIR was presented by himself and BRENNICKE in 1890. Here also inoculation experiments were negative for the brain, cord or cranial nerves, but when mice were inoculated with material taken from the neighborhood of the wound they died from tetanus in twenty-four hours. From these, pure cultures were obtained. This demonstration places bacillus without doubt as the etiology of head tetanus. The pathological significance of the facial paralysis has given rise to considerable dispute. BERNHARDT and others have accepted the possibility of a toxalbumen. And this can be none other than a ptomain produced by the tetanus bacillus. Just why the facial nerve should suffer has been explained by ROCKLIFFE and ROBERTS as due to a greater susceptibility of this nerve, while BRUNNER thinks that its more superficial position may be taken as a satisfactory cause.

Contributions to recent medical science are obtained only through persistent and painstaking effort. The gross principles have been promulgated but it still remains to investigate and specify the details. Such experimentation can only come from the best equipped hospitals and laboratories. That America is not on a level with modern experimental science may be traced directly to this absence of equipment. Just at this time the laboratory element in medical education is manifesting itself in this

country and from it and its patient workers alone can we expect to assume the foremost position in medicine.

EDITORIAL NOTES.

THE INSANITY OF EGOTISM.—An article has appeared in the *North American Review*, entitled "A Modern Form of Insanity," by Dr. H. S. Williams, which throws some interesting lights upon those indifferently understood persons "the cranks." Dr. Williams holds that the great majority of these unfortunates are diseased mentally. The disease has been termed "paranoia," and more than any other insanity is the result of an inherited mental instability. The progenitors may not have been insane, but they may have been nervously unstable from drunkenness or from some wasting disease. The offspring may be merely nervous; he may have epilepsy or chorea; he may be insane. At the best, he may usually, if properly educated, learn to understand himself and to live a sane and useful life. We have here to do, however, only with the cases in which a wrong environing influence aids in the development of a particular form of insanity. It is possible to outline pretty definitely the mental attributes. One may even point out in the child what might be termed the paranoiac temperament. Its characteristics are morbid sensitiveness and great egotism. Unfortunately, the parents of such a child usually take pride in the egoism that leads to eccentric acts, while the extreme precocity of many of these subjects causes their egotism to be fostered by ill-adjudged praise. Usually the child of paranoiac temperament is the genius of his family and the show pupil at school. Pampered and praised, even though the entire household becomes subordinated to his sovereign will, he is not satisfied, believing that he does not receive his dues. With that idea, the germs of paranoia are planted in his mind. Whether or not these germs will develop into the pathological condition that we are discussing, will depend largely upon the influences that are brought to bear upon them during adolescence and early manhood. Perhaps the most unfavorable environment is one in which the mind is developed at the expense of the body. And of course, the brilliant child is the one whose mental training will be forced. The other children of the family may stay at home, but this one must be sent to college and fitted for one of the learned professions. Usually he seems to justify this discrimination. Often he is an "honor" man at college, and he starts out into the world with every seeming prospect of an eminently prosperous career. But all this time he has become more and more eccentric. He has associated little with his fellows. Often he has shown himself possessed of extraordinary energy and capacity for application. A peculiarity often noted is a tendency to make elaborate written records of trivial subjects. Occasionally the young person of paranoiac temperament breaks down under the unbalancing influences of overstudy while still at school. But usually the critical stress comes after he has gone out into the world. He is usually not yet insane. He may never become so. If his business or professional ventures succeed, he may become distinguished, and contact with the world may gradually correct the morbid tendencies. But if adverse circumstances arise and refuse to be put down, especially if the individual's vanity is wounded by failure to rise to the heights pictured by ambition, morbid brooding may develop out of vanity, selfishness and suspicion, the delusion of persecution. But it must not be supposed that the mature condition is merely egotism and egoism run riot. That it has come to be something more than this is proved by the appearance, sooner or later, of hallucinations of one or more of the senses. These do not necessarily coincide at first with delusions. The incipient paranoiac may hear voices about him and for a time be able to convince himself of their unreality. But, sooner or later, these sounds become so tangible that they have the full force and import of actual voices. At first he hears them only when people are actually speaking, his mind merely misinterpreting what it hears. This perversion is technically termed an illusion. But at last he hears words and sentences when no real sound comes to his ears; these are true hallucinations. Perversions of other senses usually precede or follow this one. Illusions of touch and smell are common. The former lead to a belief in invisible spirits that touch the body; and the latter convince the patient that attempts are being made to poison him with noxious gases. When to this cluster of perverted sensations hallucinations of sight are added, the galaxy is complete, and the victim moves and has his being in an ideal world peopled with odors, tastes, sounds and sights that are shut out from the common herd. The patient lives a dual existence. For a time he is able to treat the actual world in the old familiar way—that is, sanely; meanwhile keeping the new and strange world hidden. But gradually he comes to confound the two existences. He comes to believe that hosts of people are leagued against him, and all sane interests give way to a desire to thwart those imagined foes. At this stage of his morbid career the patient becomes very dangerous, though he may still seem to be the most peaceable of men. Murders are often committed by patients in this condition. But many more intended murders that are carefully planned are never executed because of the irresolution of the would-be murderer.

INGUINAL BUBO RESULTING IN DEATH BY HÆMORRHAGE.—The *Boston Medical and Surgical Journal*, July 28, contains a report, by Dr. John Homans, of a case of bubo terminating in fatal hæmorrhage. It is rare that a sloughing inguinal abscess progresses to the extent of destroying the life of the patient in this manner, but neglect of treatment may as in this case readily lead up to such a fatality. Dr. Homan's patient, a male, observed in November, 1891, an inguinal swelling, which he declined to have opened. On December 8, the abscess "pointed and broke" the slough separating six weeks later. There was an oozing of blood March 18, which became a hæmorrhage on the 21st. The patient had continued at his occupation until this latter date, when he was admitted to the hospital. The femoral artery was deligated, on both sides of the slough, in its wall. Transfusion and stimulation were employed without avail, the patient succumbing after two days.

COFFIN-BIRTH.—Under this term, Bleisch has reported, in the *Viertschrift für gericht Medicin*, a case of probable post-mortem fœtal expulsion. A woman, attended by two midwives, was taken with labor pains at the end of a normal pregnancy, and after two hours of fruitless labor died. A medical examination, two hours after the death of the patient, disclosed the non-delivery of the fœtus. About three hours later the body was put in a coffin. After an interval of three days the coffin was opened and the body examined. The uterus was found inverted and extruded. A dead child, still attached to the placenta, lay between the thighs of the dead mother. It had probably been expelled subsequent to the mother's preparation for burial. By some, the expulsion post-mortem is held to be due to uterine contractions during the *rigor mortis*, the fœtus having been already advanced toward delivery by preceding vital effort. By others the post-mortem birth is explained as a result of the formation of the gases of decomposition. Possibly the interaction of these two agencies may be necessary to the production of "coffin birth."

AN ARMY MEDICAL BOARD will be in session in New York City, N. Y., during October, 1892, for the examination of candidates for appointment to the Medical Corps of the United States Army, to fill existing vacancies.

Persons desiring to present themselves for examination by the Board will make application to the Secretary of War, before October 1, 1892, for the necessary invitation, stating the date and place of birth, the place and State of permanent residence, the fact of American citizenship, the name of the medical college from whence they were graduated, and a record of service in hospital, if any, from the authorities thereof. The application should be accompanied by certificates based on personal knowledge, from at least two physicians of repute, as to professional standing, character, and moral habits. The candidate must be between 21 and 28 years of age, and a graduate from a regular Medical College, as evidence of which, his diploma must be submitted to the Board. Further information regarding the examinations may be obtained by addressing the Surgeon General U. S. Army, Washington, D.C.

C. SUTHERLAND, *Surgeon General U.S. Army.*

SELECTIONS.

THE MECHANISM OF CONCUSSION OF THE BRAIN.—In *Brain*, part i of volume viii, there is a paper by Dr. Alexander Miles supporting and confirming the conclusion published by Duret, that the group of phenomena commonly spoken of as "concussion of the brain" is the result of a temporary anæmia of that organ. This anæmia is the reflex result of stimulation of the restiform bodies, and perhaps of other important centers in the region of the bulb, produced by the wave of cerebro-spinal fluid which rushes through the aqueduct of Sylvius and the foramen of Magendie from the subarachnoid space of the brain to that of the spinal cord when a severe blow is dealt over the skull. In accordance with the laws of hydrostatics this cerebro-spinal wave will disturb the equilibrium of the ultimate nerve cells throughout the central nervous system. The hæmorrhages found throughout the brain substance and on its surface are to be ascribed to the recession of the cerebro-spinal fluid, which naturally supports the blood-vessels of the cerebrum. These petechial hæmorrhages are not the proximate cause of the symptoms of concussion, but are rather to be looked upon as an index of the force that produced the injury.

A BACTERIOLOGICAL STUDY OF DRINKING-WATER.—Dr. Victor C. Vaughan has published (*Am. Jour. of the Med. Sci.*, August, 1892) the results of his work in the bacteriological study of drinking-water since 1888. He describes the methods by which he obtains his samples, makes cultivations and inoculates animals. He concludes that many of the germs found in drinking-water will not grow at the temperature of the human body, and are therefore incapable of producing disease. Of the germs which grow at 38° C., or at higher temperatures, some are fatal to animals (toxicogenic) when injected subcutaneously, while others are not (non-toxicogenic). The non-toxicogenic germs do not multiply when injected under the skin or into the abdomen of animals; but this is not sufficient evidence that they would not multiply in the human body, so water containing them has been regarded as suspicious. Some of the toxicogenic germs produce the same symptoms and post-mortem appearances in animals as Eberth's bacillus; the properties of the former are fully equal to those of the latter, and they not only live but multiply in the animal body; water containing them was always condemned. It was found that more than one germ obtained from drinking-water grew with an invisible growth on potatoes, and that several grew on the media proposed by Parietti, Uffelman and others, as a means of recognition of Eberth's bacillus.

SYPHILIS IN NINEVEH AND BABYLON.—In *Le Progrès médical* for July 16, there is a *résumé* of a brochure by F. Buret on an interesting legend that a scribe of Sardanapalus had engraved in cuneiform characters on a brick that is now in the British museum. Istar, the goddess of illicit love, fertility, and war, the mother of the gods and of men, seduced by the lustiness of Nimrod, had solicited that hero to take her as his wife. He ungallantly refused and continued to hunt in the woods with his comrade, Eabani, a male himself, for he also could uninterruptedly employ six days and seven nights in amusing himself with the *la lú* of his sweetheart. Outraged and indignant, Istar demanded that her father, Anu, should send the sacred bull against this rebel. But Eabani had no fear of ferocious beasts, and, seizing the bull's penis, threw it at the goddess's face. Istar's fury made all the planetary system tremble, and after twelve days of struggling, Eabani was struck by death. Nimrod was afflicted with a loathsome leprosy that made his hair fall out, and his body was covered with scaly patches, and there were pustules on the phallus that was adored at Babylon. He descended into hell and was purified by the fountain of life. The author has given in a former work what he considers proof of the existence of syphilis among the ancients; and he finds in this legend of the punishment of Nimrod confirmation of all that he has written on the subject.

THE ACTION OF PHENOCOL HYDROCHLORATE.—Dr. Rudolph Bum obtained the following results from the use of this drug in wafers in the dose of 0.5–0.7–1.10 gram, and in the daily amount of 5.0 grams. Even in small doses it is a powerful, almost sure antipyretic in phthisis. In case of great weakness and in the last stages of the disease the drug should not be used. It has a slighter and much less constant action in erysipelas even when given in large doses. It has only a slight antipyretic action in rheumatism, and does not affect the disease. In migraine it acts well in doses of 0.5 gram, but has no effect in myelitis or sciatica. Unpleasant effects on the digestive tract occurred in only a few cases.—*Boston Med. and Surg. Journal.*

THE DIGESTIBILITY OF VARIOUS KINDS OF CHEESE has been recently tested by a German chemist, who placed the samples in fresh gastric juice. Cheshire and Roquefort cheese took four hours to digest; Gorgonzola and Neufchatel, eight hours; and Brie and Swiss cheese, ten hours.—*Med. Record.*

NECROLOGY.

The Late Dr. Catlin.

At a meeting of the medical fraternity of Rockford, Aug. 30, 1892, the following resolutions were unanimously adopted to express the feelings of the profession concerning the death of Dr. A. M. Catlin:

WHEREAS, Our honored and venerable associate and friend, Dr. A. M. Catlin, has entered upon a wider opportunity beyond, after having advanced to the age of 91 years, and practiced more than half a century in this community, and consequently had witnessed and taken part in the wonderful development of medical and other sciences for nearly a century; and who by his upright and consistent christian character, by his faithful and ever constant devotion to his profession, by his courteous relation to his professional brothers, to his friends and the community at large, has inspired us who remain behind to express our deep appreciation of the life that is spent; therefore

Resolved, That in the death of our brother the profession of this city has lost an esteemed and cherished member, a man of multiple virtues and no vices, and the community a man of ripe years and wisdom, who, having lived in this city from its infancy, did much to make its institutions and industries what they are.

That to his family we tender our sincere sympathy in the withdrawal from their midst of the reverent, kindly, charitable spirit that has blessed them for so many years, and express our earnest belief that these associations, beautiful here, will be renewed and perfected hereafter; and

That a copy of these resolutions be conveyed to his family and furnished for publication in THE JOURNAL of the American Medical Association.

DR. THOMAS FANNING WOOD, editor of the *North Carolina Medical Journal*, died at Wilmington, on the 22nd ult., from cardiac disease. He was born in 1841, at Nautucket, Mass. He pursued his medical studies at the Virginia Medical College and the Maryland University, taking an honorary degree from the latter institution in 1868. He settled in Wilmington and joining the New Hanover county association became its president in 1875. He was the Secretary of the State Medical Society for many years beginning in 1867. From 1863 to 1865 he was an assistant surgeon in the Confederate service, and in 1866 in charge of the small pox pavilion of Wilmington. He was a member of the State Board of Medical Examiners and Secretary of the State Board of Health. Under his direction was published the interesting little monthly Bulletin of sanitary reports, from the various local boards and committees, throughout the State. He was one of the early members of the American Public Health Association. He was a member of the American Medical Association at various times since 1878. He was connected with the *North Carolina Medical Journal* from its inception in 1878, and for a number of years was its sole editor. He had been a sufferer from aneurysm and believed himself to have been greatly benefited by rest-treatment, during a period of two years or more, and was enabled to resume a share of his public and professional duties, yet his final illness, as reported by the news-telegrams, namely cardiac disease, may have been a legacy of his former disability. Although cut down in the prime of his mental vigor he has left a record of thirty very diligent and useful years in literary and sanitary fields of labor.

DR. WILLIAM H. HENDERSON, professor of clinical medicine in the Royal College of Physicians and Surgeons, Kingston, Canada, died on the 14th ultimo, in the 37th year of his age. The final illness was due to pulmonary œdema following Bright's disease. He was a member of the college of Physicians and Surgeons, Ontario, since 1880, and a member of numerous societies.

BOOK REVIEWS.

TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION. Vol. 8. Philadelphia: W. B. Saunders, 1892. 8vo. pp. 276. Price $1.50 net.

The contents of this volume are of much wider scope than the title indicates.

The subject of influenza occupies much space, and excellent reports are given of the epidemic as it appeared in different cities, including Philadelphia by Curtin and Watson, Chicago by Fletcher Ingals, St. Louis by J. C. Mulhall and Savannah by R. J. Nunn. The discussion upon these reports was indulged in very generally by the members of the Society and took a wide range.

Pulmonary Tuberculosis is given much consideration, and papers relating to some phase or other of this important subject were read by Drs. E. L. Shurley, Edward O. Otis, Alfred L. Loomis, S. A. Fisk, H. F. Williams, T. Hilgard Tyndale, Frank Fremont-Smith. Wm. C. Glasgow and H. B. Moore.

Lymphatism is considered in a short but interesting paper by F. H. Bosworth. Dr. J. H. Musser has a suggestive paper on whooping cough. Among the other papers should be mentioned: "Notes on General *versus* Local Treatment of Catarrhal Inflammations of the Upper Air-tract," by Beverly Robinson, "Medical Treatment of Pleurisy" by G. M. Garland, "The Climate of the Greater Piedmont and Mountainous Regions of the Southern United States" by W. C. Van Bibber, "Nervo-vascular Disturbances in Unacclimated Persons in Colorado," by J. T. Eskridge, "The Surgical Treatment of Acute and Chronic Empyema" by Maurice H. Richardson and "An Experience with Diphtheria at a High Altitude" by Walter A. Jayne. The discussions are very interesting and add much to the value of the book.

THE PATHOLOGY AND PREVENTION OF INFLUENZA, by JULIUS ALTHAUS, M.D. New York: G. P. Putnam's Sons. 1892.

This little monograph of sixty-four pages is an amplification of a paper read before the Medical Society of London, and published in the *Lancet* for November 14, and 21, 1892. The author's purpose is to show "that the symptoms of influenza are owing to the action in the system of a special poison secreted by a pathogenous bacillus; that this poison has a special affinity to a definite centre of the nervous system, which is irritated and depressed by it, that an antidote which is able to neutralize the effects of the poison is formed in the blood of the patient, and tends to effect a spontaneous cure of the disease; and that the nearest approach to this antidote which we at present possess appears to be animal vaccine lymph."

PRESCRIBING AND TREATMENT IN THE DISEASES OF INFANTS AND CHILDREN. By PHILIP E. MUSKETT, late Surgeon to the Sydney Hospital, etc. Philadelphia: P. Blakiston, Son & Co. 1891.

This little book is divided into three parts, the first of which relates to dosage and therapeutics, the second to the treatment of diseases, and the third to recipes. The first part is of considerable service in suggesting the dosage of various remedies in various conditions. The second part arranged alphabetically under the names of diseases, is quite routine and not very inspiring. The subject matter is decidedly too old for a modern book on pediatrics.

ATLAS OF CLINICAL MEDICINE. By BYRON BRAMWELL, M.D., Assistant Physician to the Edinburgh Royal Infirmary, etc.

Volume i, Part 4, of this excellent work has just been issued by the University Press, Messrs. T. and A. Constable. The contents of the number are: Small-Pox; the Clinical Investigation of Cases of Small-Pox; A Remarkable Case of Globulinuria; Dr. Noël Paton's Observations on Globulinuria; Three Cases of Friedreich's Ataxia; Case of Chronic Insanity; Case of Hilarious Mania. The plates are: four of small-pox, two of melancholia, one of melancholia with strong suicidal tendency, two of mania. The high character of the work has been well maintained.

LECTURES ON PATHOLOGY DELIVERED AT THE LONDON HOSPITAL. By the late HENRY GAWEN SUTTON, M.B., F.R.C.P. Edited by MAURICE EDEN PAUL, M.D., and revised by SAMUEL WILKS, M.D., LL.D., F.R.S. Philadelphia: P. Blakiston, Son & Co. 1891.

Every page shows the author's individuality, and magnificent common sense. While nominally a work on pathology, the author devotes much time to etiology, symptomatology, and treatment. In style the didactic form prevails, and makes the book exceeding readable. The ground covered is extensive. no less than 53 separate lectures being

included, but it is in no sense a systematic treatise. It is never common place and should be read by all thinking physicians.

MISCELLANY.

THE MEDICAL SOCIETY OF THE MISSOURI VALLEY.—The annual meeting will be held at Council Bluffs, Iowa, September 15, 1892.

9:00 A.M. Registration and payment of dues. Organization. Report: Committee on credentials. Reading minutes. Miscellaneous business. Report: Committee of arrangements.

Papers: 1. Pelvic inflammations following parturition, Dr. J. G. Biller, Cherokee, Iowa. 2. Was it Auto Suggestion? Dr. S. Grover Burnett, Kansas, City, Mo. 3. The Region of the Macula Lutea in Ophthalmoscopy, Dr. M. F. Weymann, St. Joe, Mo. 4. Deformities of the Lower Limbs, Dr. J. W. Cokenower, Des Moines, Iowa. 5. Fibroid of the Uterus, report of Case, Dr. Frederic Bacon, Omaha,Neb. 6. Thrombolic Abscess, report of two Cases, Dr. Ira E. Atkinson, Fremont, Neb. 7. Malthusianism, Dr. J. M. Richmond, St. Joseph, Mo. 8. Trendelenburg's Position in Pelvic Surgery, Dr. J. E. Summers, Jr., Omaha, Neb. 9. Empyema, Dr. Donald Macrae, Council Bluffs, Iowa. 10. A Study of Seven Fatal Laparotomies, Dr. Emory Lanphear, Kansas City, Mo. 11. Cystitis in the Female, Dr. B. F. Crummer, Omaha, Neb. 12. Appendicitis, Medical and Surgical Management, Dr. A. F. Jonas, Omaha, Neb. 13. Retained Placenta, Dr. H. B. Lowry, Lincoln, Neb. 14. Warm Antiseptic Baths in Inflammations, Dr. Wm. Jepson, Sioux City, Iowa. 15. Chloroform Narcosis, Dr. H. Gifford, Omaha, Neb.

THE TRI-STATE MEDICAL SOCIETY OF ALABAMA, GEORGIA AND TENNESSEE.—List of papers for the fourth annual meeting, which will be held in Chattanooga, October 25, 26 and 27, 1892:

"Eye Symptoms in General Disease," J. L. Minor, Memphis, Tenn.

"Talipes Equino-Varus" (with presentation of patients), C. W. Barrier, Rome, Ga.

"Sequences of Otitis Media Purulenta," T. Hilliard Wood, Nashville, Tenn.

"Report of 1,050 Strabismus (Cross Eye) Operations, with some Observations on the Same," A. W. Calhoun, Atlanta, Ga.

"Special *vs.* General Practice in Medicine," W. J. Killen, Birmingham, Ala.

"Synovitis," J. B. Cowan, Tullahoma, Tenn.

"The Present Status of Medical Education in the South," Luther B. Granby, Atlanta, Ga.

"Pharmaceutical Preparations of the Present Day," Jno. C. Le Grand, Anniston, Ala.

"A Clinical Study of the Relation between Scarlet Fever and Diphtheria," W. D. Hoyt, Rome, Ga.

"The Treatment of Inguinal Hernia," J. W. Handly, Nashville, Tenn.

"Fistula in Ano," Andrew Boyd, Scottsboro, Ala.

"Stricture of the Male Urethra; its Diagnosis and Treatment," W. L. Gahagan, Chattanooga.

"Phymosis," Erasmus T. Camp, Gadsden, Ala.

"The Rational Treatment of Enlarged Prostate in Old Persons," Geo. W. Broome, St. Louis, Mo.

"Advanced Theories in Psychical Science," Jno. E. Purdon, Cullman, Ala.

"Drunkenness and Its Gold Cure?" John P. Stewart, Attala, Ala.

"Surgery—Things to Do and Things not to Do," Willis F. Westmoreland, Atlanta, Ga.

"A Few Selected Cases in Laparotomy," W. H. Wathen, Louisville, Ky.

"Extra-Uterine Pregnancy," Richard Douglass, Nashville, Tenn.

"The After Treatment of Abdominal Operations," W. E. B. Davis, Birmingham, Ala.

"Hepatic Abscess," E. B. Ward, Selma, Ala.

"Report of Treatment of Sterility," J. M. Head, Zebulon, Ga.

Titles not announced: Jno. L. Howell, Knoxville, Tenn.; J. M. Masters, Knoxville, Tenn.; C. S. Briggs, Nashville, Tenn.; I. N. Love, St. Louis, Mo.

The Committee have secured a one and one-third rate from the railroads on the certificate plan. The meeting promises to be one of unusual interest.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—very full program is announced for the coming meeting of the American Electro-Therapeutic Association which is to be held in New York, at the Academy of Medicine, 17 West 43d street, October 4, 5 and 6. There will be two interesting discussions one upon "The Relative Fœticidal value of the different Currents and their Application to Ectopic Gestation," to be discussed by many prominent Gynecologists and Electricians, and another upon "Cataphoresis and its Practical Application as a Therapeutic Measure."

Papers are announced by Drs. Geo. J. Engleman, Wellington Adams,and Geo. F. Hulbert of St. Louis,Wm. F. Hutchinson, of Providence, R. I., Franklin H. Martin, of Chicago, Ill., A Lapthorn Smith of Montreal, Canada, R. J. Nunn of Savannah Ga. Thomas W. Poole, of Lindsay, Ontario, C. Eugene Riggs, of St. Paul, W. J. Herdman, of Ann Arbor, Mich., D. S. Campbell, of Detroit, Mich., G. Betton Massey, of Philadelphia, Henry D. Fry, of Washington, D. C., H. E. Hayd, of Buffalo,N. Y., J. H. Kellogg, of Battle Creek, Mich., C. G. Cannaday, of Roanoke, Va., Ernest Wende, of Buffalo, N. Y., and Wm. J. Morton, Augustin H. Goelet, A. D. Rockwell, Landon Carter Gray, Robert Newman, Ephraim Cutter, Frederick Peterson, G. M. Hammond, F. Van Raitz, of N. Y., and many others. Dr. J. Mount Bleyer, will give an instructive lecture with demonstrations entitled, "The Phonograph and Microphonograph,the Principles underlying them and their Uses in the Sciences."

In connection with the meeting, there will be an exhibition of modern medical electrical apparatus, all the prominent manufacturers being represented.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 20, 1892, to August 26, 1892.

Capt. Louis M. Maus, Asst. Surgeon U. S. A., so much of Par. 9, S. O. 194, A. G. O., August 18, 1892, as relates to change of station, is suspended until further orders. By direction of the Acting Secretary of War.

Major Paul R. Brown, Surgeon U. S. A. (Ft. Supply, I. T.), is granted leave of absence for one month, to take effect on or about September 1, 1892.

Major Joseph K. Corson, Surgeon U. S. A., leave of absence granted is extended one month.

Lieut.-Col. Charles R. Greenleaf, Deputy Surgeon-General, now at Montpelier, Vt., will proceed to Plattsburg Bks., N. Y., on business connected with the Medical Department, and on completion thereof will return to Montpelier.

First Lieut. Paul Shillock, Asst. Surgeon U. S. A., now on temporary duty at San Carlos, Ariz. Ter., is relieved from duty at Ft. Grant, A. T., and assigned to permanent duty at San Carlos, A. T., relieving First Lieut. Nathan S. Jarvis, Asst. Surgeon. Lieut. Jarvis, on being relieved by Lieut. Shillock, is ordered to Ft. Apache, A. T., for duty, relieving Capt. Louis M. Maus, Asst. Surgeon. Capt. Maus, on being relieved by Lieut. Jarvis, is ordered to Whipple Bks., Ariz. Ter., for duty.

Capt. Richard W. Johnson, Asst. Surgeon U. S. A., is relieved from duty at Ft. Bayard, N. M., and ordered to Ft. Bowie, A. T., for duty at that station, relieving First Lieut. Philip G. Wales, Asst. Surgeon. Lieut. Wales, on being relieved by Capt. Johnson, is ordered to Ft. Bayard, N. M., for duty at that station.

Capt. Walter Reed, Asst. Surgeon U. S. A., upon the arrival of First Lieut. Charles F. Mason, Asst. Surgeon, at Ft. Snelling, Minn., will be relieved from duty at that station, and will report in person to the commanding General, Dept. of Dakota, for duty as attending surgeon and examiner of recruits at the headquarters of that Department.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending September 3, 1892.

P. A. Surgeon E. H. Marsteller, detached from practice ship "Constellation," and to the Naval Academy.

Asst. Surgeon James Stoughton, detached from practice ship "Constellation," and to wait orders.

P. A. Surgeon W. F. Arnold, ordered to Naval Station, Port Royal, S. C.

P. A. Surgeon S. H. Griffith, detached from the U. S. S. "Jamestown," and to the U. S. S. "Constellation."